VARIETY·PAPERS

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Variety Papers

Or Glimpses of

Romance in the Realm of Fact

BY

CHARLES CARROLL MORGAN

Revised Edition

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Dedication.

TO THE
FORTNIGHTLY CLUB OF NASHUA, NEW HAMPSHIRE, THIS
LITTLE VOLUME IS RESPECTFULLY DEDICATED BY
ITS AUTHOR, IN GRATEFUL ACKNOWLEDG-
MENT OF HIS AGREEABLE RELATIONS
WITH THE CLUB FOR MORE
THAN TWENTY YEARS

Preface

The following papers were written at various times from 1887 to 1905. Except the one on "The World of Invention," they were addressed originally to the Fortnightly Club of Nashua, N. H., an organization of which the writer has been a member from its birth. In accordance with the wishes of the Club, the papers were meant to instruct as well as to please. A few of them, therefore, may be found a little more didactic than is usual with productions intended for popular reading. All have been carefully revised; yet, in substance, they remain nearly the same as at first.

As a desire for the publication of some of these papers has been repeatedly expressed, the author has seen fit to embody them in the present volume. He will be much pleased if they are found more widely useful than he anticipated.

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GATES OF SULTAN'S PALACE, ORTA KENY

Variety Papers

I

THE CITY OF THE GOLDEN HORN

Upon the hilly shores of the narrow strait which connects the Sea of Marmora with the Euxine is a famous city — so widespread, so unique, and so picturesque, that it strikes the beholder with astonishment. It stands like a Colossus, one foot in Asia and the other in Europe, commanding what was once the principal gateway of the East. Tradition says that when Io — a divinely beautiful maiden, transformed by the cunning of enamored Jupiter into a milk-white heifer — fled from the wrath of his vengeful spouse, she escaped by swimming the intervening waters to the western shore. The strait, therefore, has been known from the earliest times as the Bos Porus.

On the European side of the Bosporus, not far from its junction with the Sea of Marmora, is a broad, navigable inlet, thrusting itself into the heart of the city between low ranges of hills, and narrowing and tapering inland with a graceful curve till it comes almost to a point. The setting sun often illumines its placid surface with a sheen of resplendent gold — the more brilliant by contrast with the darker shores,

here and there embowered with trees. It is The Golden Horn. The apex of the horn receives a small mountain stream known as the Sweet Water — a name often applied to the whole liquid expanse extending thence to the Bosporus.

North of the Golden Horn, toward the Black Sea, is the Frank quarter of Constantinople — including chiefly the great commercial district, known as Galata, and a subordinate residential district, called Pera.

South of the Golden Horn — toward the Sea of Marmora — is Stamboul, the distinctively Moslem or Turkish quarter. No " dog of a Christian " may dwell here, except as servant or slave. Once strongly fortified, Stamboul now presents only a feeble barrier of ruined walls, with towers and gates, and with a broad moat or ditch, once filled with water, but now drained and cultivated in good part with gardens.

On the Asiatic side of the Bosporus is that part of the city known as Scutari — having a promiscuous population, of various nationalities, scattered along the shore for a distance of two or three miles from the Sea of Marmora.

Altogether, there are gathered in the several districts of Constantinople about a million inhabitants — the most motley assemblage on the face of the globe. Here the Orient and the Occident clasp hands; here civilization meets semi-barbarism; here refinement encounters brutality; here Christian faith contends with Mohammedan and pagan superstition; here

modern social life confronts medieval and patriarchal; here a vast human concourse — as from all parts of the earth — is poured into one great seething maelstrom, in whose depths there is such a commingling of elements as is known nowhere else under the sun.

Constantinople is the most cosmopolitan city in the world.

Physically viewed, it is a broad expanse of hills and dales and intervening waters. Its topography has been but little changed; except for purposes of fortification, or as the structures of later ages have been reared upon the crumbling ruins of the past. In many parts, it is beautified with gardens and with shade trees, which a genial climate permits in almost endless variety.

At a distance, the most noticeable features of Constantinople, except the hills, are its mosques, or churches for Mohammedan worship, many of which occupy commanding sites, and, with their graceful domes and slender sky-piercing minarets, present to the eye of the western beholder a unique and wonderfully beautiful aspect.

The city is rich in treasures of Byzantine architecture — some exceedingly delicate and exquisite, almost outrivaling the Gothic in elaborate sculpture, yet rarely if ever presenting a somber or gloomy appearance. They are veritable blossoms of art. Of these, I shall speak more particularly by and by.

The most interesting locality in Constantinople is Galata Bridge — sometimes called the Bridge of

Sultana Validé — which spans the Golden Horn from Stamboul to Galata. It consists of numerous flat-boats, or pontoons, moored side by side, over which there is a continuous platform or carriage-way of rugged plank. Across this bridge moves a ceaseless throng — so varied in complexion, in nationality, in dress, and in language, that it seems almost a concourse of the nations gathered for some grand festival of the ages. I cannot do better in describing it than to quote a few paragraphs from a vivid word-picture by the Italian writer, De Amicis.

"The crowd passes in great waves, each one of which is of a hundred colors; and every group of persons represents a new type of people. Whatever can be imagined that is most extravagant in type, costume, and social class, may there be seen within twenty paces and in ten minutes of time.

"Behind a throng of Turkish porters, who pass, running and bending under enormous burdens, advances a sedan-chair, inlaid with ivory and mother of pearl, and bearing an Armenian lady; and, at either side of it, a Bedouin, wrapped in a white mantle, and a Turk in muslin turban and sky-blue caftan, beside whom canters a young Greek gentleman, followed by his dragoman in embroidered vest, and a dervish with his tall conical hat and tunic of camel's hair, who makes way for the carriage of a European ambassador, preceded by his running footman in gorgeous livery. All this is only seen in a glimpse: and, the next moment, you find yourself in the midst of a crowd of

Persians, in pyramidal bonnets of Astrakhan fur; who are followed by a Hebrew, in a long yellow coat open at the sides; a frowsy-headed gypsy woman, with her child in a bag at her back; a Catholic priest, with breviary staff; — while, in the midst of a confused throng of Greeks, Turks and Armenians, comes a big eunuch on horseback, crying out *Larya!* (make way), and preceding a Turkish carriage painted with flowers and birds, and filled with the ladies of a harem, dressed in green and violet, and wrapped in large white veils; — behind, a Sister of Charity from the hospital at Pera, an African slave carrying a monkey, and a professional story-teller in a necromancer's habit. And what is quite natural, but appears strange to the newcomer, all these diverse people pass one another without a look, like a crowd in London; and not one single countenance wears a smile.

" It is a changing mosaic of races and religions, that is composed and scattered continually with a rapidity which the eye can scarcely follow.

" The contrasts between people loaded down with garments, looking like walking bazaars, and people almost naked, are most extraordinary. The spectacle of so much nudity is alone a wonder. Here are to be seen all shades of skin-colors, from the milky whiteness of Albania to the crow-blackness of Central Africa and the bluish-blackness of Darfur; chests that, if you struck upon them, seemingly would resound like a huge bass drum or rattle like pottery; backs, oily, stony, full of wrinkles, and hairy like the back of a

wild boar; arms, embossed with red and blue and decorated with designs of flowers and inscriptions from the Koran.

" But it is not possible to observe all this in one's first passage over the bridge. While you are examining the tattoo on an arm, your guide warns you that a Wallachian, a Servian, a Montenegrin, a Cossack of the Don, a Cossack of Ukraine, an Egyptian, a native of Tunis, a prince of Imerezia, is passing by. It seems that Constantinople is the same as it always was — the capital of three continents and the queen of twenty vice-realms."

All this, and much more, De Amicis presents in his one graphic picture of the throng on Galata Bridge.

A learned British linguist, long resident in Constantinople, once remarked to an acquaintance of mine that he had heard twenty-six different languages and dialects spoken in a single crossing of the bridge.

The scene, as viewed from Galata Bridge, is one of surpassing beauty. On each side, are myriads of light rowboats or caïques, — many of them, mere fairy shells, cushioned, carpeted, and capable of skimming the water like a bird. Steamers and sailing vessels plow the liquid expanse in various directions; and the scene, as a whole, is one of the most fantastic life and gaiety.

But beneath all this outward show is a somber depth — a weird, a shadowy, an almost incomprehensible history, often dark with tragedy, but here

and there presenting brighter gleams which light the heavens as with a bow of promise. No other city, except the Holy City and the Eternal City, presents so interesting a history.

Twenty-four times has Constantinople been besieged; six times has it been captured. Of its score or more of assailants, only Alcibiades, the Athenian, — Constantine, the Roman, — Dandolo, the Venetian, — Paleologos, the Greek, — and Mohammed II, the Ottoman, have entered its gates. For over a century and a half, it held at bay the Moslem invader. Not less than twelve times was it beleaguered by the armies of the Crescent before it fell beneath their terrific assaults. And then, what a scene of blood! what a torrent of flame! what a carnival of rapine!

Mohammed II invested the city with an army of over two hundred thousand of the best trained troops in the world. At their head, were the famous Janissaries — a corps composed of the very flower of Christian youths captured at a tender age in numerous wars, carefully reared in the Moslem faith, and skillfully trained to arms. The Janissaries were the first regular standing army known in history. They constituted a kind of imperial bodyguard.

On the Turkish side, during this siege, rude mortars or huge guns were used, which threw enormous granite balls — some of them weighing twelve hundred pounds. Through breaches in the walls, opened by these ponderous shot, entrance was again and again attempted. But the assaulting columns were repelled

with showers of missiles and with Greek fire; till at last, advancing under the eye of the Sultan, headed by the giant Janissary, Hassan, they resolutely forced their way.

As the cry rang out, "The Turks have entered the city," thousands of the inhabitants rushed to the Church of Sancta Sophia — some believing the conquerors would not dare to profane it, others expecting the promised apparition of an angel from Heaven who would annihilate the invaders. Many watched from the windows; numbers bowed in prayer. But the sound of the trumpets and the clash of arms drew nearer. Soon the doors of the sacred edifice were battered down. An infuriated horde rushed in, and the work of rapine and desecration began. Shouts of triumph and yells of rage commingled with shrieks of terror and groans of agony. But suddenly all was hushed. Mohammed II, entering on horseback, rose in his stirrups and uttered the ringing proclamation of his faith, "Allah is the Light of Heaven and of Earth!" As he reined in his steed beneath the mighty dome, it is said, he placed his bloody hand against one of its supporting piers, and left an imprint that is still pointed out and is declared to be the prototype of the cipher or sign-manual which the sultans still affix to their edicts of state. This cipher or its analogue is seen on many Turkish coins and often on embroideries.

The capture of Constantinople by Mohammed II marks one of the principal epochs in the world's

history. It established firmly the Mohammedan power in Europe by securing to it the most commanding stronghold on the high-road to Asia. Ever since, the presence of the Moslem has rested like a blight upon what was once the fairest portion of the Eastern Empire; and the burning question of the centuries in Europe has been, "What shall we do with the Turk?" Repeated crusades have been undertaken against him, and more than a million lives and many millions of treasure have been sacrificed. But the turbaned monster still sits astride the neck of European diplomacy as did the Old Man of the Sea that of Sinbad the Sailor.

In one way, the immediate results of the capture of Constantinople — which was then the chief seat of Grecian learning — proved beneficent. It caused the dispersion of its famous classic scholars and its rich libraries among the nations of the West, and thus gave birth to a revival of learning in Europe which was the immediate forerunner of the Christian Reformation.

The fall of Constantinople occurred in 1453 — thirty-nine years before Columbus discovered America.

In connection with this event, what shall we say of the religion of its captors — the Moslem or Mohammedan faith — which has proved so enduring and has spread so widely in heathen lands, that rears its head today so defiantly in the Turkish capital, that holds in its trammels over two hundred million believers, and is adhered to with such terrible

fanaticism? Is it wholly bad? If so, how has it effected its wonderful conquests, and how does it maintain so tenacious a hold? Remember that, although it antagonizes Christianity, it is more closely allied to the religion of Jesus than is any other faith except Judaism. In fact, Mohammedanism, notwithstanding its corrupt features, is based chiefly on Judaism and Christianity. It teaches first and foremost that there is but one God. It accepts, in good part, the Holy Scriptures, of both the Old Testament and the New. A Christian minister, formerly resident in Constantinople, states that a Kurdish Sheik once said to him: — " Why do not the great Bible societies of England and America print the Bible and the Koran together? Both are revelations from God; the only difference is that the Koran, being later, is more authoritative. Print them both together, and then we shall have the complete revelation." But it must be admitted that when the Mohammedan finds the teachings of the Bible hostile to those of the Koran, he rejects the former with intolerant bitterness.

The worst feature of the Koran is its sensual paradise, the anticipation of which so sadly degrades the Moslem character.

One of the most important facts respecting Mohammedanism is that the whole of its teachings is not found in the Koran and the Bible; but much is embodied in weakly authenticated traditions, framed to accommodate the debased habits and inclinations of

the peoples among whom it has been introduced.* This fact affords one of the chief explanations of its ready acceptance. It cannot be denied that the Koran has done much to elevate the character of the nations it has redeemed from heathenism. It has driven out their senseless gods of wood and stone; it has introduced prayer to the only true God; it has taught temperance, personal cleanliness, charity to fellowmen, and kindness to the lower animals. Besides it has led, at times, to the promotion of learning. Yet, largely because of its sensuality, it has failed to uplift the hearts of its disciples in sincere and ardent devotion to the Supreme Being.

To the Moslem, sin is but little more than a transgression of human statutes. His religion is almost inseparably connected, in his belief, with the interests of the State. In a large measure, he adheres to the ancient oriental idea — common to both pagan and Jew — that modes of faith pertain to distinctive nationalities or peoples. Accordingly the Sunnites, or principal branch of the Moslem Church, who believe the sultan to be the true Caliph, or successor of the Prophet, regard him as the lawful head of the State. Prominent Turks sometimes admit in private that, should the sultan be stripped of his imperial authority,

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* These traditions — embodied in a record known as the Sunna — are accepted by the Sunnites, or those who recognize the sultan of Turkey as the head of the Church; but, in general, are rejected by the Shiites, or those recognizing the shah of Persia as its head.

their religion would be liable to crumble. It would no longer be manifest that he enjoyed the protection and favor of Allah, or the Supreme Being. Is it too much to hope that, under such circumstances, many Mohammedans would turn to a purer and better faith, and that Islam would be found to have opened the door to Christianity?

The sultans are careful to secure to themselves a marked recognition of their distinction as Caliph — or head of the church, as well as of the body politic — by making a frequent and impressive show of their religion. On Friday — which is the Mohammedan Sabbath — the present sultan, following the example of his predecessors, goes in stately procession to mosque with the chief members of his household. It was my privilege to witness one of these processions. A large body of cavalry and infantry, brilliantly uniformed, guarded the way and constituted the escort. His Majesty rode in advance, attended by high officers of state. As I sat at a window in the Hall of Foreign Embassies, directly opposite the mosque, I had good opportunity to see him. He is a man of scarcely more than medium stature; but his fine form, erect bearing, high head and flashing black eyes give to him a commanding appearance.

In a carriage immediately following the sultan was his mother, who is customarily treated with the deference due to a queen. As the companion of a former sultan, — purchased by her lord, — she was looked upon, until her son's accession to royalty, as, in a

sense, a mere slave. Each of the sultans, having been born of a bond-woman, has been accustomed, in his humility, although bearing many sovereign titles, to designate himself as the "Son of a Slave." But, on his coming to the throne, the slave being recognized henceforth as the mother of the "Successor of the Prophet," who is the assumed head of all the sovereigns of the earth, she is at once dignified with a precedence second only to that of her imperial offspring.

Next in the sultan's procession, after his royal mother, came the women of the harem. They command a respect approximating to that of wives, only when they have borne children. The sultan has no wife proper. It is said that his dignity, as the Successor of the Prophet, is too great to allow his entering into matrimonial relations. But the mother of his oldest son and probable successor is customarily spoken of as the sultana or wife. As I saw the feminine beauties of the harem, looking from the windows of their passing carriages — each veiled with a thin gauze yashmak which left exposed only a narrow strip of the fair face just above and below her piercing dark eyes, — I must confess that the sight was bewitching in the extreme.

The sultan's stay at the mosque was comparatively brief — seemingly but little more than sufficient for repeating appropriate prayers.

The superb edifice at which he now worships is one, lately erected, that bears his name. It is near the

Yildiz Kiosk, or "Palace of the Star," in which he resides.

Many of the mosques bear the names of the sultans in whose honor they were reared. They were built, however, not by the sultans themselves, but generally by their respective mothers.

Of the splendor of these edifices, it may be proper for me to speak briefly. All are of Byzantine architecture. Each presents a massive central dome, with numerous smaller domes and usually three or four tall minarets. The latter tower high above the rest of the structure, and are surrounded, in most instances, with two or three slender galleries, from which the muezzins call, in chanting tones, five times a day, the hour of prayer: — "Most High! There is no God but the One God! Mohammed is the Prophet of God! Come to prayer! Come to the Temple of Life!" As this cry rings out over the city, every faithful Mussulman, whatever may be his occupation or in whatever duties he may be engaged, turns at once toward Mecca, prostrates himself, and expresses his grateful homage and humble petitions to the Sovereign Ruler of the Universe. The scene is deeply impressive, especially to those who are unaccustomed to such devotions.

I have before spoken of the Church of Sancta Sophia — or Saint Sophia, as it is commonly miscalled by Christians outside of Mohammedan territory. Originally a Christian temple, now a mosque, its name, Sancta Sophia, means the Holy, or Divine, Wis-

dom. It was built by the Emperor Justinian, upon the site of an ancient heathen temple, in the years 533 to 537. Three Christian churches, following the pagan structure, had preceded it upon the same spot — the first, built by Constantine the Great two hundred years earlier. When Justinian completed this grand edifice, such was its magnificence that he is said to have exclaimed: — "Glory to God, who has deemed me worthy to accomplish such an undertaking! Solomon, I have surpassed thee!"

Many heathen temples were rifled for its adornment. The eight great columns of green marble, or serpentine — four on each side of the nave, beneath the front of the galleries — were from the famous temple of Ephesus known as one of the Seven Wonders of the World — a temple consecrated to the worship of Diana, whose glory Demetrius and his fellow-craftsmen proclaimed when they grew riotous against the Apostle Paul, fearing that his preaching would deprive them of their occupation as makers of shrines in honor of the goddess. Eight other columns — which are of porphyry, set in pairs at suitable intervals, beneath the floors of the galleries, between the nave and the side walls of the church — once graced the Temple of the Sun at Baalbek. The Emperor Aurelian brought them on his return from his conquests in the East, and gave them to the pious Marcia, by whom they were sent to Justinian. Other columns were brought from the Temple of Helios at Palmyra, from the Temple of Jove at Cizicum, and from various

temples at Thebes, Alexandria, Athens, Rome, the Troad and the Cyclades. Many are of jasper, some of sienite, and some of verd antique or other richly colored marbles. The capitals of a good number are carved with patterns of great intricacy and beauty.

For the floors and walls of the cathedral, ordinary marbles, it is said, were disdained. Only the rarest, the richest in color, the most exquisitely spotted and veined, were chosen.

Vast areas in the interior of Sancta Sophia were originally covered with mosaics which represented scriptural subjects. Some of them afterwards were altered by the Moslem possessors, to destroy their Christian significance. Immense inlaid figures of seraphim, for instance, once looked down from the pendentives of the dome; but they have been transformed into mere nondescripts. Yet at a glance I perceived the original designs. A good share of the richest mosaic ornamentation, Christian in character, is now hidden beneath heavy coats of whitewash. The altar, with its golden sea and magnificent studding of precious stones, — the richly jeweled pulpit, — the massive cross of solid gold, — all, are gone. The splendor of the cathedral is dimmed; the interior pervaded with an atmosphere of gloom. Yet much of its glory remains, impressing the beholder with wonder and awe.

Of the Moslem features of the edifice, permit me to say a few words. A niche, in one of the pilasters of the apse, indicates the direction of Mecca — the Mo-

hammedan Holy City. High up, at the right, is one of the four carpets on which Mohammed was accustomed to kneel in prayer. Pulpits, or platforms with sculptured balustrades and rich arabesque arches, here and there stand forth in graceful beauty. Opposite the principal pulpit is the tribune of the sultan, closed with a gilded lattice. Aloft, upon the face of the broad piers which support the dome, are hung immense green disks, inscribed in letters of gold with passages from the Koran. Great chandeliers, holding cups of olive oil in which inflammable wicks are upheld by ivory floats, are suspended from the ceiling. During the sacred month of Ramazan (the Mohammedan Lent) when three thousand of the holy lamps are lighted at night, the temple is said to glow with marvelous beauty. Suspended from above with silken cords, are many huge ostrich eggs — typifying the sacred truth that the present holds the germ of the future, or of the life beyond the grave, and suggesting the wisdom of faith and patience. Near them also hang globes of crystal, suggestive of the brightness and serenity of the celestial spheres. Here and there are lecterns, or low reading desks, inlaid with mother of pearl and supporting manuscripts of the Koran. Prayer rugs, rolled in huge bundles or spread for worshipers, lie about the floor.

The outward beauty of Sancta Sophia is marred by colossal buttresses, erected to support the walls, shattered by repeated earthquakes. But above them rises the vast central dome, and still higher the aspir-

ing minarets, giving to the exterior a noble aspect. Within are accommodated 25,000 worshipers. The original cost of the edifice with its grounds and furnishings has been estimated by a careful Greek historian at $64,000,000 — or more than that of St. Peter's in Rome.

The memorable events which have transpired within the walls of Sancta Sophia can hardly be enumerated. Here Chrysostom (the Golden Mouth) electrified vast audiences. Here the Fifth, Sixth and Eighth Ecumenical Councils were held; and, after prolonged debates, promulgated their historic dogmas. Here the Patriarch Nicholas I dared to shut the door in the face of Emperor Leo VI, and to declare him excommunicated, because of his unlawful marriage with a fourth wife. Here the pagan envoys of Prince Vladimir of Russia, who were sent forth to search the world for the true religion, over-awed and enraptured as they gazed on the magnificence of the temple and observed its splendid ritual, became convinced of the peerless excellence of the faith it proclaimed; and so carried back to their master the glad news which brought Russia to accept the Christianity of the Greek Church. Here Cardinal Humbert, attended by two Latin bishops, laid upon the altar the papal excommunication and anathema which forever dissevered the Greek Church from the Roman Catholic. Here also the adventurous warriors of the Fourth Crusade, crazed with their success in the unrighteous capture of Constantinople, indulged in shame-

less debaucheries, — seating a vile courtesan upon the throne of the patriarch, — singing obscene songs, in nasal mockery of the Greek chants, — and profaning the bread and wine of the Holy Eucharist.

Of other great mosques in Constantinople, I must speak briefly.

The Mosque of Eyoub, Mohammed's standard-bearer who perished in the first Arab siege of Constantinople about eight centuries before its capture by Mohammed II, is deemed the holiest in Europe. Tradition says that, soon after the capture, an angel revealed the place of Eyoub's tomb, hidden beneath a depth of earth. A splendid mausoleum now covers the spot, and beside it has been reared the stately mosque. Neither may be profaned by the tread, hardly by the gaze, of an infidel. Here in the Mosque of Eyoub is kept the sword of Osman, founder of the Osmanli Dynasty. With this redoubtable blade, as an emblem of rightful sovereignty, each sultan is girded, with impressive ceremony, on coming to the throne.

The Mosque of Mohammed II, the captor of the city, is the most towering structure in Constantinople.

The Mosque of Suleiman the Magnificent is unrivaled in the harmony of its vast proportions and the exquisite beauty of its interior. Capable judges pronounce it the most superb sanctuary in the Mohammedan world.

The Mosque of Ahmed — covering a part of the grounds once occupied by the Palace of Constantine

the Great, the ancient Hippodrome, and the chief Byzantine forum — is also a masterpiece of art. Distinguished by six minarets, or but one less than that of the famous Kaaba at Mecca, it is deemed second in sanctity to none in Europe, except that of Eyoub.

The Mosque of the Holy Mantle contains the simple vestment which once covered the shoulders of the Prophet, and which is revered as one of the most sacred relics of Islam.

Near many of the mosques are the tombs of sultans. The most famous of these, after that of Eyoub, is the tomb of Mahmoud II (called the Great), distinguished for his liberal statesmanship and his many reforms. Within this palatial structure are three sarcophagi, the central one containing the ashes of the revered sovereign, while on one side stands that of the Validé Sultana — mother of his immediate successor, Abdul Medjid — and, on the other, that of his son and later successor, Abdul Aziz. Both the British and French governments, in grateful recognition of their amicable relations with Mahmoud II, have contributed to the adornment of the tomb. Its splendors are unsurpassed probably by those of any other, except the world-famed mausoleum of Shah Jehan in India.

Near the Mosque of Eyoub is a *via sacra* of tombs containing the remains of many of the most eminent persons in Mohammedan history. It is an imposing avenue leading to a Moslem cemetery which overspreads a neighboring hill. From the brow of the hill,

looking down the Sweet Water and across the Golden Horn, the prospect is, perhaps, with a single exception, the most beautiful in Europe. I shall never forget its dreamy loveliness;—the distant hills of Asia half descried through a filmy veil of mist, a faint glimmer of the Bosporus, dim lines of bridges across the broad tidal inlet, the sparkling waters rippled in long wavy lines by sturdy vessels or slender caïques, bits of bright color in the costumes of the voyagers, verdant groves along the shores, fairy-like dales and tiny coves, — some of them graced with gay picnic-parties from harems, watched over by jealous eunuchs, — fantastic groups of dwellings, superb mosques, and, here and there — springing flower-like from the soil — exquisite fountains and other graceful structures of Byzantine architecture.

The Sultan has several palaces in the city and upon its borders. Unrivaled in splendor is the one known as Dolma Bagtche. Built by the father of the recent sultan (Abdul Hamid II) and meant to be peerless, it stands upon the European shore of the Bosporus, and is best seen outwardly from the deck of a passing steamer. As an architectural triumph, I believe that no other palace is worthy to be compared with it. The Tuilleries and the Palace of Versailles, seen beside it, would be plain structures. As I caught the first glimpse of this miracle of art, it seemed to me almost a vision of enchantment raised by a magician's wand. No description of mine can do justice to its magnificence. Unfortunately I saw it only in passing. Per-

mit me, however, to quote a few sentences concerning it from the sketch of an enthusiastic writer: —*

"The far-stretching, snow-pure Serai, or Palace of Dolma Bagtche, with its interminable dainty wings and its profuse carvings, delicate as lace, is in its whole effect ethereal as a dream. Its foreground is the strait, with its ever-sparkling waves of deep Ionian blue; its background is the hillside, covered with the mazes of the Imperial Park, and clothed in perennial green. A pearl, placed between a turquoise and an emerald, each jewel multiplied in size and loveliness many million fold, is the fittest simile to picture the palace and its peerless setting." . . . "Though many times I have passed through its resplendent portal, and climbed its crystal stairway and wandered along its inlaid walls and through rooms whose floors and walls and ceilings are of alabaster, I carry with me now, as I carried with me then, only a sense of bewilderment and dazed confusion. Broad tablets of malachite and lapis-lazuli and vert antique; curtains so heavy that they would stand erect in their massive tissue; plate mirrors, the largest ever made; candelabra of cut glass, flashing the light from three hundred and thirty-three silver sockets (a mystic number); every Western as well as every Eastern splendor in color and gold; recollection and words fail in the endeavor to recall and describe them."

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* Prof. Edward A. Grosvenor, in his admirable work entitled "Constantinople," p. 136.

Amidst all this magnificence have been passed the later years of Mourad V, the brother and predecessor of the recent sultan. A few days after his exaltation to the throne, and before he had been girded with the sword of Osman, he was deposed — a council of physicians having declared him imbecile. Dolma Bagtche became his asylum, — possibly his prison, — and later may be his portal to the great unknown.

A smaller palace of the sultan, exquisite in beauty, which stands on the Asiatic shore, nearer the Black Sea, was occupied by Queen Victoria and her retinue during her visit to the city some years ago.

The palace, known as Yildiz Kiosk, or the Palace of the Star — the present abode of the Ottoman sovereign — has been made familiar of late by frequent mention in the newspapers.

Viewed historically with reference to its Mussulman possessors, the most interesting part of Constantinople is that which includes the grounds and few remaining buildings of the Old Seraglio. It is the easternmost portion of Stamboul, bordering the Bosporus and the outer harbor of the Golden Horn. Containing one of the seven hills of the city, it was at an early period strongly fortified, and is still inclosed by battlemented walls and towers.

The chief entrance to the grounds of the Old Seraglio is by the Imperial Gate. From this gate, through which for centuries the sultan and his council sent forth their decrees, originated the name, "Sublime Porte," as expressive of the sovereign

authority. Within niches on each side of the gate were once displayed, in times of treasonable disturbances, the dissevered heads of grand viziers and other officers who had offended the capricious monarchs or were displeasing to their haughty favorites. The Imperial Gate opens into the Court of the Janissaries —a bare area, in the midst of which stands an ancient plane tree, whose trunk, nearly fifty feet in circumference, has been hollowed out by decay. Within is a chamber capable of seating about thirty persons. Here I rested while my dragoman told me how it had been frequented by groups of rollicking or sulking and plotting Janissaries, and how this indomitable corps of troops, setting at defiance their ruler, was mowed down by the cannon shot of Mahmoud II.

From the Court of the Janissaries, the Gate of Peace opens into a second court, a vast irregular space, inclosed by an arcade with slender marble columns. On the left is the Hall of the Divan, once occupied by the council of nine viziers, charged with the administration of justice, but often the mere instruments of despotic cruelty.

A third court is entered by the Gate of Felicity, admitting to the Seraglio proper. Once, whoever passed this gate was required to kiss its threshold. Professor Grosvenor speaks of it thus:—*

"Bewildered by anticipation of unfolding mystery, and by the rushing medley of association, the stranger

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* See his "Constantinople," p. 722.

involuntarily pauses as he approaches its opening doors. The blood is stirred at the thought of a vaster throng of beauties than have entered through any other doors on earth. As the maiden, Abishag, was sought, for King David, throughout all the coasts of Israel, so hundreds, thousands, of other maidens as fair were sought, among the subjects and the captives of an Empire, for the lord of the Seraglio. With eyes bright as stars, with breath like the flowers of spring, with arms white as the houris', with airy steps that left no footprint upon the ground, through more than three hundred successive years they were ceaselessly entering here. During three and a half centuries, there was not a sultan, from Mohammed II the Conqueror to Mahmoud II the Reformer, for whose magnificent passing, this portal was not almost daily opened wide. Sometimes while the sultan trembled within, the Janissaries thundered at the brazen panels of the gate, until their bloody hunger was appeased by the corpses of the noblest in the state, cast at their feet."

Within the court, or enclosure of the Seraglio proper, were once clustered pavilions, palaces, mosques, baths, fountains, etc., promiscuously scattered in endless variety. Most of them have been burned; yet a few remain, to attest the former grandeur. Here is the Hall of the Throne, where the sultan once received homage and granted audience; here the Treasure House, once filled with untold riches, and still containing a wonderful store of jewels

and priceless relics; here is the Imperial Museum, containing marvelous specimens of Greek art — among them, a superb sarcophagus, the most beautiful in the world, made probably to the order of Alexander the Great, by the sculptor Lysippus, for the body of a favorite officer of Alexander; here, too, is the Chamber of the Holy Mantle, containing five cherished relics of the Prophet, including the Sacred Standard, which, unfurled on memorable battlefields and in national crises, has more than once inflamed Mussulman zeal to a pitch of frenzy.

Beyond the court of the Seraglio are terraced gardens, rich in bloom and fragrance, with flights of marble steps descending to the sea.

Many of the buildings within and around the courts of the quarter known as the Old Seraglio are now used for Government offices. The residence of the sultan was removed hence on the completion of the Palace of Dolma Bagtche.

I have told you of the commanding situation of Constantinople, of its marvelously attractive scenery, of its strangely mixed populations, of its dominant religion, of its superb mosques, magnificent palaces and mysterious seraglios. Unquestionably there is here a high degree of civilization: there is also considerable learning; for the Prophet commanded encouragement to "men of the book." Yet most of the chief officers of state are such as have acquired a good part of their education in Western Europe — many of them in Paris. All are accomplished gentlemen.

The questions doubtless present themselves to your minds: What may we expect of all this? Is Turkey progressive? Will it ever escape the thraldom of a degrading, sensual faith? Will it become enlightened?

The tales of bitter fanaticism, of atrocious cruelties, and of horrible massacres, which come to us so often, are fraught with discouragement. Yet there is much in the records of the nineteenth century to inspire hope.

Mahmoud II, the grandfather of the present sultan, was a great reformer. His destruction of the Janissaries was but one of his many important achievements. It may be doubted whether any sovereign of such perverse subjects could have accomplished more.

His son, Abdul Medjid, a ruler of less vigor, yet remarkable for his liberal tendencies, soon after coming to the throne, promulgated a veritable Magna Charta of Turkish liberties. It guaranteed to all subjects security for life, honor and fortune; it established anew a regular system of assessing and levying taxes — declaring they should be according to the means of each person; it provided for an equally regular system of levying troops and limiting the terms of their service; it proscribed monopolies; it " promised laws that should fix the expenses of the land and sea forces, with the contingent of each locality "; it " ordered that every cause should be tried publicly according to the civil and religious laws "; that every

subject should hold and dispose of his property in all freedom; and that the estates of a criminal should not be confiscated nor his heirs deprived of their legal rights.

Afterwards Turkey became a party to the Treaty of Berlin, which secured further pledges of reform. Among these were assurances of better administration in the Island of Crete and in all districts inhabited by Armenians; also a guaranty of religious liberty throughout the Turkish Empire.

In 1856 Abdul Medjid issued another proclamation, which was pronounced the most notable ever coming from a Moslem ruler. It was for the good especially of his Christian subjects; and provided for the confirmation and enlargement of the benefits previously guarantied to them and assured by the Treaty of Berlin.

But you may ask: Were these promises meant to be fulfilled; is it not a principle with the followers of the Prophet that " no faith is to be kept with an infidel "? So far as Abdul Medjid was concerned, I have little doubt that his promises were sincere. Of the purposes of his son, Abdul Hamid II, I forbear to speak.*

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* Abdul Hamid II was deposed, April 26, 1909 (some years after the above was written), as the result of an almost bloodless revolution, headed by the Young Turkish Party. He was succeeded by his younger brother, Mehmed V, who — like the older brother, Mourad V (see page 23) — had been long imprisoned in a palace.

Bedouin Arabs

Undoubtedly it is a rule of the Moslem faith that no compact is to be kept which is plainly and directly hostile to the religion of the Prophet — just as it is a rule of Christianity that no compact is to be kept which is unquestionably opposed to the precepts of our Saviour. But Moslem authorities have long recognized the desirableness of greater religious toleration, and to a considerable extent have maintained it; although, in some instances, they have permitted and undoubtedly encouraged shameful persecutions and inhuman massacres.

Yet that much has been gained in the East, Christian missionaries frankly admit; notwithstanding it is only a beginning. Let us remember, however, that the accomplishment of the needed reforms is attended with almost insuperable difficulties. The great diversity of populations — speaking many languages and ranging in advancement all the way from gross barbarism to marked civilization, — the various religions besides Mohammedanism, the numerous sects even among the Moslems, the lack in some parts of the empire of any well-settled industries, the warlike and predatory character of tribes long at variance, and withal a deeply rooted spirit of oriental conservatism, render the establishment of the proposed reforms, and especially the effecting of a speedy change, nearly impossible. Besides, the best efforts of the sultan in a liberal direction are liable to be thwarted by those averse to radical measures, especially by the Old Turkish Party, whom to set at defiance might

result in his dethronement and not unlikely in his death.

But let us live in hope. Much is to come, not only from the efforts of the representatives of foreign governments and from the work of Christian missionaries, but also from the rapid growth of intercourse with enlightened nations.

Already commerce is opening new avenues through the heart of the empire, and is offering its choicest boons as a stimulus to enterprise. Natural greed prompts the more enlightened Turks to their acceptance. The railway, the steamship and the telegraph are slowly but surely supplanting tardier means of communication. Ere long the toilsome caravan, with its heavily laden camels and pack-mules, will become a thing of the past. Where now are the ruins of ancient cities will be busy marts of trade. The desert will again blossom as the rose; the light of modern science will irradiate the Ottoman mind; and Moslem exclusiveness will yield to Christian philanthropy.

II

CLIMBING MONT BLANC IN A SNOW-STORM

Swiss guides claim that, with the help they afford, there is but little danger in scaling their rugged mountain peaks and traversing the broken and slippery glaciers. Yet, every year, many lives are lost in such ventures, and scores of travelers recount fresh perils.

The Swiss newspapers say little on the subject. But the Government requires the erection of safeguards at many points, and forbids persons, without a license — after ample proofs of fitness — to conduct mountain climbers. Besides, the guides are organized into associations, having public offices and enforcing stringent rules.

At one time, many small crosses marked the places where serious accidents had occurred; but the crosses at length became so numerous, it was thought best to remove them lest they should cause alarm.

It was on my way to a spot of peculiar interest to me, once marked by such a cross, that I first set foot on a glacier. High on the narrow path which skirts the great Grindelwald ice-fall and beneath the shadow of frowning rocks, my sister had gone over a precipice, on horseback. The earth and stones had given way beneath the hind feet of the beast; and down he went, dragging the guide who clung to his bits, till all struck

upon a narrow shelf of rock about thirty feet below. Here the lady and her guide chanced to lodge, while the horse rolled over, and, tumbling to the bottom of the ravine, was dashed in pieces. Bruised, bleeding, insensible, and with her right ear nearly torn from her head, the unfortunate woman was rescued by her husband from the perilous situation, and was borne, with the aid of the guide — who escaped serious injury — to a place of safety. A fortnight's confinement to her room at a hotel, under skillful surgical treatment, restored her, so she was able to travel; although, for many years afterwards, she suffered from the nervous shock.

The guide who conducted me to the place of the accident, also accompanied me beyond, and pointed out the scenes of similar disasters. In one of these accidents, a young Englishman, whose body now lies in the little churchyard at Grindelwald, went down to his death.

From the brow of a lofty crag overhanging the path, the guide's father, while chamois hunting in winter, had been swept by an avalanche — burying his lifeless form in the snow. Near the foot of the crag, I saw a woman, sitting with her back to the wall of rock, overcome with fright at the dreadful abyss below. Her face was of death-like pallor; her eyes, protruding and glassy. She seemed literally a frozen statue of terror. How she was relieved, I know not. No hoof-prints now mark the path; for it has been disused for horses.

The day after my visit to Grindelwald Glacier, I went through Lausanne and Montreux to Martigny. As I passed the Castle of Chillon on the northern shore of Lake Leman, I thought of the good Prior Bonnivard, imprisoned in the depths of the castle, chained to a column, around which he walked till his footsteps wore a path in the stone, — and of the words which Byron puts in his mouth: —

> " My hair is gray, but not with years,
> Nor grew it white
> In a single night,
> As men's have grown with sudden fears:
> My limbs are bow'd, though not with toil,
> But rusted with a vile repose,
> For they have been a dungeon's spoil,
> And mine has been the fate of those
> To whom the goodly earth and air
> Are bann'd and barr'd — forbidden fare;
> But this was for my father's faith,
> I suffered chains and courted death."

Everywhere the mountain districts of Switzerland have been the nurseries of a strong religious faith.

After a comfortable night at an inn in Martigny, I went on, over the Tête Noir Pass, to Chamouni. As I saw elderly women dragging loaded handcarts up the long, steep mountain-road — sometimes with the aid of little children, or of dogs, — I was impressed with the toilsome lives of many of the Swiss peasantry. Wherever a spot is found suitable for cultivation, even though but a few hundred feet below the snow line, there the soil is tilled, — the mountain sides, in

some places, being cut into terraces edged with interlaced sticks and with slight abutments of stone to hold the earth.

During my first two days at Chamouni, the weather was dull and lowering; Mont Blanc was wrapped in impenetrable mists. Indeed, I could scarcely believe I was at the foot of the most towering peak in the Old World, west of the Caucasus. But the clouds at length scattered, and the summit shone out in such snowy luster that it seemed close at hand.

On the second day, in company with an Italian count of broken fortune, who served me as a guide, I ascended, by a rude pathway through a pine forest, as far as Montanvert; and thence, unattended, crossed the Mer de Glace, to the Chapeau. It seemed a bold venture; for, although well equipped with alpenstock and hob-nailed shoes, I was not yet so experienced in glacier walking as to be fully confident of my footing. I omit recounting my experience; since enough of the kind will be told a little later.

From the Chapeau — a high rock, of hat-crown shape, — there is a superb view of the Mer de Glace, where it crowds through a narrow pass between the cliffs. The glacial ice is broken into fantastic shapes, sometimes enormous blocks which dissolve into pyramids and needles and reflect a dazzling radiance beneath the noonday sun.

At the lateral moraine on the farther side, I struggled downward over a slippery path, strewn with bowlders, and often through deep gullies between the

edge of the glacier and massive ledges of rock. Here and there, I lowered myself by ropes stretched from rock to rock, — or, clinging to the ropes, slid down the precipitous way.

The count had left me at Montanvert; and returning by way of our ascent, had passed along the foot of the glacier to the farther side, where, with a saddle horse, he awaited my arrival.

I was soon mounted; and proceeding a little way up the valley, crossed the River Arve and began the ascent of the formidable mountain-buttress known as La Flégère. For a little distance, the path ran near a glacier. Leaving the saddle, I climbed, with the aid of my alpenstock, upon the ice; but had not gone far, before my guide informed me the situation was perilous, and advised my return. Continuing, by a zigzag path up the stony slope, we came in about two hours to the small inn known as the Croix de la Flégère.

From the brow of the mountain and across the Chamouni valley, we saw, in all its grandeur, the entire length of the Mont Blanc range. Its jagged peaks, somber with declining day, pierced the clouds; and their dark masses strangely contrasted with the milk-white glaciers and rounded snowy crests which lay between, and with the broken forests that straggled upward from the base. Through the valley below, ran the Arve and Aveyron, like slender silver ribbons, crumpled here and there with tiny rapids. A few Swiss cottages dotted the landscape, and two

or three church spires rose in the distance. With reluctance, we turned from the enchanting scene; and in the lengthening shadows of evening, wended our way back to the little village of Chamouni — so fraught with pleasant recollections.

Opposite me, at the hotel table, sat three English ladies. The elder, whom I may call Miss C., was, as I afterwards learned, a relative of the poet Wordsworth, who had often visited at her father's house. The two younger, apparently in her charge, were charming sisters, who had just blossomed into womanhood. A slight conversation at mealtime led to further sociability, which soon ripened into a pleasant acquaintance.

Both the young ladies were anxious to attempt the difficult ascent of Mont Blanc, over the Glacier des Bossons. They appealed to my judgment to determine whether they and their companion could not go at least as far as the Grands Mulets. I had seen them before on the Mer de Glace, and had observed that they walked with a firm step and a confident air. They assured me, they were accustomed to long and severe tramps. Their bright eyes and ruddy cheeks betokened the hardihood of English ladies accustomed to spend much of their time in the open air. I replied, therefore, affirmatively; for experience in mountaineering with ladies had taught me, long before, that many a woman will bear quite as much fatigue as a good average man.

My opinion was reported to Miss C., and, after a

Our Mont Blanc Party

little deliberation, the three proposed the attempt, if I would accompany them. To this, I cheerfully consented; for it was my purpose, long before entering Switzerland, to ascend Mont Blanc to as great a height as travelers often attempt. But I little foresaw the hardships and perils to be overcome.

Under the rules applicable to such parties, we were required to take with us three guides and a porter. A stalwart member of the Devouassoud family — who were among the most noted guides in Switzerland — became our leader; the sturdy Count made a good second; a smaller youthful guide, who had a smattering of English, became the third; and a tall brother of the before-named Devouassoud served as porter.

On the morning of July 31, the sun rose in clouds, and a drizzling misty rain prevailed; but the sky soon cleared, and the guides assured us of a pleasant day, a prediction by no means fulfilled.

Mounted upon the backs of mules led by our attendants, and climbing a rugged mountain path on the left of the Glacier des Bossons, we came in about three hours to the little refreshment-station at Pierre Pointue. Here, leaving our mules, we rested half an hour, and indulged in a simple meal.

The hard task of the day was before us. Clad in garments of moderate warmth, with hob-nailed shoes and stout leggins, and wearing blue glass goggles — the latter for the protection of our eyes against the glare of light from the snow and ice, — we cheerfully

sallied forth. The ladies and myself were provided, each, with a stout alpenstock having a sharp spike firmly set in the lower end. Our attendants were provided in like manner, each, with an ice ax having an adze-shaped transverse blade, tapering toward the rear into a strong pick, and set on a handle about four feet and a half long, ending, like an alpenstock, in an iron spike. The blades were used occasionally for cutting steps for the feet or notches for the hands in the icy steeps, — often for scraping away the snow to make sure of our footing. The picks served, when needful, to strike deep into the ice, so as to draw one's self up with them when scaling abrupt walls. Two of our guides carried coils of rope, with which we could be lashed together when on perilous footing.

For half an hour, we traveled over a mass of shaly rock, strewn with loose stones. Here and there we crept along the face of frightful declivities stretching down hundreds of feet into ice-filled ravines. On reaching these declivities, we were tied together in two parties. The ropes were bound about us beneath the arms, leaving about eight feet between each person and the next one following, — and, a little in front of each, with the exception of the leader, was formed a slipping noose which was grasped with the hand and served, in case of a fall, to prevent, by its drawing out, a sudden and violent jerk upon the neighboring members of the party. The ropes were not removed until we reached our destination in the evening.

We came at last to the border of the great glacier. Picture it clearly in your mind's eye. Imagine a depression in the mountain side, five or six miles in length and from half a mile to two or three miles in breadth, — filled with partially melted downward-creeping ice — in some places, perhaps, a thousand feet thick. It was partly covered with snow, and, at intervals, rent with fissures or crevasses, some of them extending to the rocky bed beneath. Down the ravine, the glacier irresistibly pushed its way, conforming in a measure to the surface beneath, here and there rough and precipitous, occasionally tossed into billows and strewn with masses of ice, but oftener presenting gentle slopes. It was as if a sea had suddenly burst its bounds, and, as it rushed impetuously to a lower level, the Frost-King had stretched forth his scepter and arrested it in its mad career. Heaved out at its sides were ragged rocks, huge bowlders, smaller rolling stones, and broken débris, forming a lateral moraine which in many places was impassable.

Cautiously picking our way amid such obstructions, we came to a perpendicular wall of rock. Along the face of this, we clambered, treading upon a slippery shelf, so narrow that it would scarcely afford a foothold. But we hugged closely to the wall, and clung to iron bolts with which it was sparsely studded, till at last we reached a point where we climbed upon the ice above.

As I stepped upon the glacier, and surveyed its

immensity, here and there tossed into confusion and plunging downward in frozen cataracts, I thought of the lines of Coleridge: —

> " Ye ice-falls! ye that from the mountain's brow,
> Adown enormous ravines, slope amain —
> Torrents, methinks, that heard a mighty voice,
> And stopped at once amid their maddest plunge, —
> Motionless torrents! silent cataracts!
> Who made you glorious as the gates of heaven
> Beneath the keen full moon? Who, with living flowers
> Of loveliest blue, spread garlands at your feet?
> God! let the torrents, like a shout of nations,
> Answer; and let the ice-plains echo, God!
> God! sing ye meadow-streams with gladsome voice,
> Ye pine-groves, with your soft and soul-like sounds!
> And they too have a voice, yon piles of snow,
> And in their perilous fall shall thunder, God! "

My heart thrilled with emotion at the sublimity of the scene and at the thought of the adventurous struggle which awaited us in scaling these frozen ramparts, barred with such awful intrenchments.

Snow had begun falling before we reached the glacier. Now it drove full in our faces, and presently thickened into an almost blinding storm. But, encouraged by the guides with the hope it would soon cease, we pressed on. Yet the snowstorm continued, with but little abatement, throughout most of the day.

Soon we grew familiar with stepping over, or leaping across, narrow crevasses penetrating in some instances to a fearful depth. Here and there we were forced to make our way across more formidable

openings in the glacier, over ice-bridges only twenty or thirty inches wide, with deep yawning chasms on each side. But we planted our alpenstocks firmly in the treacherous frozen mass, and set each step carefully before taking the next. Occasionally the approach to a narrow bridge was down a steep, almost perpendicular, wall of ice, along the face of which we slid six or eight feet, striking our alpenstocks as we alighted. Sometimes, however, the guides cut two or three rude steps, to aid in the descent or in climbing up on the opposite side.

The loose snow had now deepened several inches, and walking became much more laborious.

Ere long we were high up on the face of sharp acclivities, where a downward slip would hurl us to certain destruction. The thunder of avalanches occasionally filled our ears; and, far off, we saw vast snowslides and the ascending snow-spray which thickened the air. Our guides charged us to move cautiously and silently, lest a snow-mass above should be loosened and sweep down upon us.

At first, they had watched me carefully; but, at length, remarking that I was a good glacier-walker, they gave me little or no attention. The ladies most needed their care. Yet presently it flashed across me, if I should lose my footing on one of these perilous steeps, that — as I was roped at the extreme rear of the party and was unobserved, with the tall porter in front, who might be toppled over like a slender spire in a hurricane, — no human aid could be prompt

enough to rescue me. Tied fast to three of my companions, I should drag them down to a horrible death. My blood chilled in my veins at the dreadful prospect, not so much, however, from fear for my own safety as from thought that the guides were trusting too implicitly to my skill as a mountaineer, and that some one of the ladies whom I had counseled to the perilous ascent might lose her life through my ignorant and ill-considered advice. I would have given all the gold on my person to have been well back in Chamouni, or to have been alone with the guides. Yet I spoke not a syllable; but, reflecting on their long experience and good judgment, directly regained my composure. Had I then understood the use of the slipping nooses in the rope which bound us together and their drawing out so as to prevent a sudden violent jerk in case of an unexpected fall, I should have been less disquieted.

At length we reached a gentler slope, and plodded on wearily through the deepening snow. The hot July sun shone out fitfully, and the chill of the icy air which had slightly benumbed our hands was somewhat abated. But a new source of peril appeared. We had been over five hours upon the glacier, engaged in the most toilsome ascent, and the strength of the ladies apparently was giving out. A halt was called, and we dropped in the snow for rest. The foremost guide drew from his pocket a flask of brandy, and poured out a small allowance for each. All, but myself, accepted it. I declined the stimulus — preferring

to eat two or three small crackers I had put in my pocket, which proved sufficiently refreshing. A few moments' respite in our mountain-climbing helped to revive us, and shortly we resumed the ascent. We passed the Pyramids of the Glacier — huge blocks of ice thrown up from its surface, — some of them, that had been long melting in the sun, pyramidal, — others, of later origin, square or oblong and nearly as large as a good-sized dwelling house. They were strewn here and there, as if Titans had wrenched them from their native bed and hurled them about in wild confusion. Our progress through their midst seemed like a march through chaos. Few objects which I saw during our trip impressed me more with the tremendous forces of Nature.

After struggling about an hour and a half longer up the mountain side, against the blinding storm, we met two descending travelers, with three guides. They were reclining in the snow for rest; and, as we passed them, one of the travelers was heard to say, "I don't see how the guides can get those ladies over that crevasse."

A half hour later, we realized what he meant. We came to a freshly opened crevasse, five or six feet in breadth, with a perpendicular wall of ice on the opposite side rising as high as our faces. We had no ladder; but we must cross it, or our women would sink exhausted in the snow. Their return was impossible; the way was too long, and the day too far spent.

The guides deliberated. Presently our leader,

Devouassoud, stepped to the edge of the crevasse and directed that the slipping noose in the rope between him and his nearest companion should be drawn out. Then, poising himself on the brink of the crevasse, he ordered us to hold fast to the rope and lower him forward at the shoulders until he could reach with his ax the other side. Standing at a perilous inclination to the opposite wall of ice, he proceeded to cut a step in it nearly on a level with our feet. Then, scraping the snow from the brink of the wall above, he cut a notch a little beyond, for his hand. Drawn back to his former position, he directed us to advance until we had given him about two yards of loose rope and then stand firm. Hardly had we done this, before he leaped lightly across: one foot rested upon the opposite step; his left hand caught in the notch; and, his right hand dealing a sweeping blow with his reversed ax, he drove the stout pick in its rear firmly into the ice beyond. It was but the work of an instant for him to clamber up. We held our breath as we witnessed the attempt, but gave a glad shout as we saw him standing on the other side. In a few moments, he had planted the handle of his ax deep in the glacier, a little beyond the crevasse; and, having trodden down the snow about it and tied the rope to the handle, close to the ice, he called on us to cross. At this juncture, two porters descending from the Grands Mulets arrived; and volunteering to assist our leader, spoke encouraging words.

The first to respond was Margaret, the elder of the

two young ladies, — possibly a little beyond her 'teens. But she was of heroic English stock. Nothing daunted, although fully realizing the gravity of the situation, she stepped boldly to the brink of the crevasse. Her gaze was riveted upon the opposite wall; her color came and went; her chest rose and fell with labored breathing: she lingered a full minute; then, summoning all her courage, leaped. Her foot struck the opposite step; the ice crumbled beneath it; she slipped off, and fell with a heavy jerk. But she was sustained by the rope: the men on the other side quickly pulled it in, lifted her up, — and she was drawn over the wall, in safety.

The rest of the party speedily followed; but none of them found support upon the opposite step. Each of the ladies showed the utmost heroism. 'Linda, the youngest, surprised me with her courage; for she leaped without hesitancy. Before Miss C. leaped, the slipping noose of the rope in front of her, through some oversight, was not withdrawn. She sprang across the chasm; her foot missed the step; the noose was pulled out; she dropped, about eight feet, into the depths; the rope jerked violently, but was not broken. To my surprise, she was drawn up, scarcely frightened and almost unhurt. My own turn came last. There was no one behind, to uphold me; I could be aided only by those on the farther side. I jumped into the chasm, dangled at the rope's end like a criminal from the gallows, and was ignominiously hauled up.

The guides again refreshed the exhausted members of the party with brandy. The toilsome march was resumed. But each step grew more wearisome. We had been many hours on the glacier, and were walking ankle-deep in snow — much of the time up a steep incline. Our feet dragged painfully over the almost interminable acclivity. Repeatedly I asked myself, Will the end ever be reached? I learned afterwards that many persons who knew of our set-out were much alarmed lest we should be lost in the severity of the storm.

At length, high up among the pinnacles of rock which overtopped the glacier, we descried the little chalet that was to shelter us for the night. The evening shades were fast creeping on, and we were almost ready to drop. But we uttered a cry of joy; and pressed on, up the long and precipitous slope to the Grands Mulets, until at last, our hearts overflowing with gratitude, we entered the hospitable door. Thanks to a kind Providence and to the skill of our guides, we were not only in a place of safety, but at the highest point we had hoped to reach — a little over ten thousand feet above the sea.

The chalet was but a small cabin, with walls of rough stone broken from the mountain-side. It contained only four rooms, one used for a kitchen and dining room, the others for lodgings. A low attic, entered through a small opening in the ceiling by means of a ladder, served as a sleeping place for the guides and porters.

The house was kept by a wiry little Swiss woman, Marie Terrasse, who was not only hostess, but clerk, cook, chamber-maid, nurse, purveyor of needful wraps, and vender of warm garments and knickknacks. She was a complete retinue in herself. But Marie knew how to command, and the guides and porters were submissive. Cleanliness was none too carefully observed; and we found it wise to remember we were "roughing it," and not to see over-much. Our party, especially the ladies, were as kindly and attentively cared for as the multifarious duties of the hostess would permit. Soon we were refreshed with a hearty meal, and were merrily talking over the events of the day.

Marie told us that sometimes thirty persons had been entertained here over night; but that she was often alone, — and, in a few instances during a long storm, had spent a fortnight in this dreary abode, without a single companion. Fortunately the weather here, in summer, is seldom severely cold; for but one fire is kept — both for warming the house and for cooking, — and whatever supply of coal is requisite must be brought up on the backs of porters. Provisions are transported in the same way.

The only guest at the chalet, besides ourselves, was a Russian gentleman, who, starting several hours before us, and favored longer with clear weather, had attempted to reach the top of the mountain. But, when only about a third of the way beyond the Grands Mulets, he and his guide had been driven back

by the blinding snowstorm and the fierce blasts which threatened to sweep them from the sharp crests. Twice before, in former years, he had tried unsuccessfully to reach the summit; but he assured me, he should persevere until he accomplished the task. Two days later, favored by exceptionally calm and clear weather, he won his way, and stood, triumphant, upon the highest point of the Alps — 15,730 feet above the sea.

At the office of the guides in Chamouni, where a careful record is kept of the ascent of every traveler, I was informed that, on an average, only two or three a year reach the summit; although many more report, they have climbed to the top.

Not long after supper, I crept out alone into the night. Oh, the blackness of the darkness; oh, the desolation and solitude! Declining day had chained the snow masses to the steep crags; no longer was heard the roar of avalanches; everywhere solemn stillness prevailed. Standing upon the rugged rocks, I could but faintly discern the interlocking edge of the glacier. Dead Nature lay, in her winding sheet, before me. But a pall of gloom stretched between. I put forth my hand; it seemed almost as if I could clutch the darkness. I stooped down, and felt my way, clinging to the rock, lest I should be precipitated over a jutting cliff. My eyes refused to perform their office; before them, hung a black veil. I strained my vision — to look, as it were, into Hades. But no answering spirit rose up to meet my gaze. I was alone,

terribly alone. Shrinking, appalled, from the gloom, I crawled, almost upon my hands and knees, back to the door of the cabin. The worn-out inmates had gone to rest. I retired to a room, where I found the weary Russian snoring upon a mattress; and was soon wrapped in blankets and lost in dreams.

The sun rose, next morning, bright and clear. An early start was proposed, for the descent of the mountain; since it was desirable to look out a new way, so as to avoid the formidable crevasse. Alpine guides always follow substantially the same route between important points, until it becomes impracticable; and then, with much care, seek out a new one. It is remarkable, with what seeming instinct they direct their course through the pathless snows.

But one incident of our descent of Mont Blanc is of special interest. Coming to a long and precipitous slope, the guides requested us to lie down, in single file, flat on our backs, — with our feet directed toward the bottom of the steep, but raised considerably above the snow. Then, at a given signal, we were told to slide; and away we went, dashing down the mountain side, with fast-increasing speed, until we shot far out upon a gentler incline, and came to a halt. It was the wildest kind of tobogganing, — yet with no toboggan but the clothing on our backs.

Soon after we had regained our feet, I missed a small flask of *eau-de-vie*, which, at the request of the ladies, before starting, I had put in my pocket, for their refreshment in case of exhaustion. I mentioned the

loss to one of the guides; and, against my earnest protest and assertion that it was irretrievably lost, he insisted on going back for its recovery. I don't know whether Alpine guides ever have noses like St. Bernard dogs, capable of smelling out whatever is buried in the snow; but one thing is certain, — he went almost straight to the flask, and, in a few moments, returned, holding it up triumphantly. As I congratulated and thanked him, he looked wistful volumes at me. But — shall I say it to my shame? — I omitted inviting him to share with me in the contents of the flask.

Our descent of the mountain took about nine hours. It was quicker and less fatiguing than the ascent, although scarcely less perilous; for the narrow ice-bridges we crossed were more numerous, — and some, lower down in the crevasses and more difficult to reach. Yet peril is the spice of adventure. A courageous person enjoys battling with difficulties, and finds pleasure in conquering dangers.

You may ask me: Does climbing Mont Blanc pay; is it not a fool-hardy venture? I answer: You cannot enjoy the full grandeur and sublimity of the mountain scenery without ascending its lofty heights. If you would behold the greatest wonders of Nature, if you would realize something of her mightiest forces, stand amid the eternal snows, and look out over the neighboring Alpine summits; see how the Earth's crust has been torn and rent, how it is ridged and peaked with terrestrial masses rising from the bloom

and beauty of summer into arctic desolation and solitude; behold the awful crags, amidst which the Frost-King has fixed his enduring throne; gaze upon the clouds beneath, here and there screening the valleys, and see their bosoms riven with jagged lightnings as they pour out summer showers; survey the enormous ice-fields, from which cascades leap forth and rivers rush down the mountain sides; listen to the thunder of the avalanches, and watch the snow-spray floating away in the misty air; see the huge glacial fragments, glittering in the noonday sun and challenging his fiercest rays; watch, at evening's decline, the roseate glow which touches the pure white summits with a maternal kiss, as they are folded to rest in the bosom of Night. Can you look upon such a panorama as this, and your heart be unmoved with a sense of the Divine Presence? Can aught else beneath the stars rival it in majesty?

I would not give my two days' experience on the heights of Mont Blanc for years of life's common level, replete with the choicest pleasures, but devoid of heroic achievement.

III

WONDERS OF THE HUMAN MIND

Milton, in describing the banishment of the fallen archangel to the infernal world, represents him as solacing himself with the thought that he is superior to outward circumstances, — and as exclaiming, at the sight of his gloomy abode: —

> "The mind is its own place; and, in itself,
> Can make a Heaven of Hell, a Hell of Heaven."

Perhaps no stronger words were ever used to denote the supremacy of intellectual being. Yet, exalted as is this being, it is so identified, in man, with his material substance, that many philosophers have doubted whether the human intellect or soul can exist beyond the body or can last beyond the natural life. Some consideration, therefore, of the constitution of the human mind may be desirable at the beginning of our discussion.

Mind may be defined as the thinking and emotional part of our being. To what portion of our organic structure it is limited is not absolutely determined.

The ancients fixed the seat of reason in the brain; of the emotions, in the heart and reins. The Sacred Scriptures speak of believing with the heart — referring, however, to such belief as inspires feeling, or a disposition to trust and to act in accordance with the

belief. Thus it is said, "With the heart, man believeth unto righteousness." So, on the other hand, it is said, "My reins shall rejoice when thy lips speak right things." The placing of the emotional nature in these parts undoubtedly was due to observing that they are powerfully affected by the emotions.

We continue to use the word, heart, as synonymous with the affections and disposition; although modern science generally places both reason and the emotional faculties in the brain.

The principal grounds, upon which it is contended that the human intellect or soul cannot exist beyond the body, are the following: —

Through our personal consciousness, we know nothing of the activities of the intellect, except as they are manifest in the body. It grows with our growth, strengthens with our strength, reaches its maximum vigor during our healthy maturity, declines with bodily enfeeblement, — in old age, sinks into lassitude and imbecility, — and, at death, is seemingly extinguished.

The mind depends for its development mainly upon the senses. Nearly all its elementary ideas are gained through sight, hearing, touch, taste and smell. Some philosophers — Locke, for instance — contend that *all* knowledge is acquired through the senses. When therefore death closes the eyes, paralyzes the hearing, palsies the touch, and annihilates the taste and smell, what assurance have we that all the gates of intelligence are not shut and barred forever?

There is as good reason to believe that the brain is the great organ of thought as that the eye is the organ of sight. If the action of the brain is deadened by a blow, by intoxication, by an internal effusion of blood or water, or by other causes resulting from disease, — insensibility follows; and, during the period of insensibility, we have no more evidence of the existence of thought, either within or without the body, than of sight with closed eyes. If death ensues, and the brain is smitten into permanent inaction, why should we not conclude that thought and intelligence have ceased forever? If for an hour, why not for eternity? Even healthful slumber apparently deprives us of thought. We say that we have slept a dreamless sleep. May not the sleep of death be a never-ending unconsciousness?*

Questions like these sometimes press upon us, and disturb the serenity of our faith in a hereafter. Does science afford an answer to such inquiries, or are we left solely to the testimony of the Inspired Word?

While we must admit the dependence, to a great extent, of mind upon matter, in its ordinary relations with the human body, it is evident that, if treated as wholly dependent, it must be assumed that mind is

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* There is strong reason, however, to doubt whether the mind is ever wholly unconscious during sleep; for the want of consciousness is not proved by inability, on waking, to remember thoughts which occurred while asleep. In the following pages of this paper (see pp. 78–79) it is shown that but few of our thoughts — either waking or sleeping — are so impressed upon the memory as to be available, except under extraordinary circumstances or when the mind is in an abnormal state.

the product of matter rather than matter of mind or of intelligent spirit. Yet as the material universe presents itself to our view as an organized structure, arranged in accordance with an intelligent design and acting wholly under law, we must infer the previous existence of a designer and a law-giver. Even the ablest materialistic philosophers are forced to recognize the universality of law. From the origin of cloudy nebulæ, to the development of suns and planets, each holding its assigned place or moving in a majestic orbit, unconflicting with the neighboring spheres, or from the beginning of bioplastic matter to the manifestations of the highest forms of animal life, it is plain that all has been wrought out by competent forces, under the direction of a Supreme Intelligence. The harmony of the spheres testifies to the existence of a Creative Mind. The growth of the smallest flower, with its admirable arrangements for nutrition and reproduction, bespeaks an All-Wise Providence. But the human body, with its surpassingly intricate mechanisms, all working fitly together, performing the most varied functions and largely submissive to an indwelling intelligence, affords unanswerable proof that it is the product of an Infinite Designer. We are forced, therefore, to conclude that mind existed before matter, or that the Divine Spirit once brooded alone over an empty universe.

In opposition to this conclusion, I believe that the only argument which can be adduced, with any show

of plausibility, is that of the pantheist: namely, that God is all, and all is God: and, therefore, that, if we assume he is self-existent and without beginning or end of days, we must concede that matter is uncreated; that the Divine Spirit and the divine substance always have coexisted in the same essential relations to each other; and that what we call the manifestations of the divine will in Nature, or Nature's laws, are in reality not laws, since they were never ordained, but are only the eternal and unchangeable attributes of the Deity.

Yet, as the consciousness of every individual testifies, in accordance with the common belief, that man is a distinct entity, and not merely an included vital portion of a universal being, or of a single person who comprises in himself every other so-called person or thing, living or dead, — I deem it needless, in the present brief paper, to point out the several fallacies of the pantheistic view.

Assuming, then, that the Divine Mind, or Spirit, existed before all things else, and that it not only created matter, but from the beginning has maintained absolute supremacy over matter, does it seem reasonable to conclude that, in the exercise of its immeasurable wisdom, it so constituted lesser minds as to make them a mere outgrowth of matter and, in the end, perishable with matter; or, in other words, that the Creator has so inwrought the human intellect with our corporeal substance that, at the dissolution of the body, it will be annihilated or resolved into unrelated

elements? On the other hand, is it not far more likely that the human mind was created superior to the body; and that, as an intellectual or spiritual force, although it may be changed in its outward relations, it will survive the body — being not less persistent than any of the physical forces of Nature?

Authorities in science tell us that natural force is never annihilated; that, although it may be changed in appearance, or in the character of its manifestations, it remains the same in essence and in the measure of its power; that a given amount of light, for instance, may be changed into a certain amount of heat, and this, again, into a certain amount of electricity; that the process may be reversed, and that either, in the same relative proportions, may be developed from the other; but that each is an outcome of the same indestructible force — the manifestations, only, being varied by different subjective conditions. Reasoning, then, from analogy, are we not justified in presuming that the intellectual or spiritual force is equally persistent and indestructible?

As the Divine Mind is creative, and from the beginning has exercised a shaping and controlling power over the universe it inhabits, may not the human mind also be so endowed as to be, in some measure, creative; and may it not, from the dawn of its instinctive intelligence — the inception of which, we have reason to believe, comes largely from the parents, and especially from the mother during the period of gestation — have unconsciously or in-

voluntarily exercised, to some extent, a shaping and controlling power over the body in which it dwells?

It may be observed that the mind acts powerfully upon the body, not merely by the will, but by its purely intellectual and emotional states.

Character is graven involuntarily upon the countenance, by thought and feeling, in lines of habitual expression marking the progress of its growth. How different is the face of the student, guiding his mental processes by the exercise of judgment and will, from that of the undisciplined thinker; how unlike, the lineaments of the man of brutal temper, to those of one of noble spirit; how different, the face of innocence, from that of passion and cruelty! Every artist, skilled in human portraiture, knows the outward signs of predominant traits of character. The saintliness of the Madonna and the hatefulness of the hag are pictured with equal facility.

The power of the emotional nature over the body, exercised unconsciously or, to a great extent, irrespective of volition, is manifest in almost numberless ways. It is seen in the frown of hatred, the smile of pleasure, the curling lip of scorn, the downcast expression of sorrow, the upturned eye of devotion, the blush of modesty, and the pallor of fright. It is heard in the laughter of mirth, the groan of anguish, the gentle murmur of love, the sigh of disappointment, the chuckle of satisfaction, the roar of anger, the cry of alarm, and the grumble of discontent. It brings tears to the eyes; it thrills the heart, or stops

its beating, or fills it with a bursting sensation; it causes the choking feeling, of "the heart coming up in the throat"; it arrests or quickens respiration; it starts a cold sweat; it takes away the power of speech and motion, or quickens to unusual activity; it bows the form, or straightens the figure and dilates the muscles; it makes haggard the face, or imparts to it a glow of animation; it brings fainting, convulsions, delirium and insensibility; it whitens the hair; it causes paralysis, apoplexy, and sometimes, death. These are but a few of the known effects of the mind upon the body, resulting from its emotional states, *nearly or quite irrespective of the promptings of the will.* Physicians and psychologists can add many more to the list.

The influence of the mind upon the body, as a formative principle, or determinative involuntary force, is strikingly illustrated in certain cases of heredity — or of the abiding results, in the appearance and character of the child, of the mother's thoughts and feelings during the period from the child's conception to its birth.

The present writer knew a poor boy who, year after year, wandered about the streets, presenting the appearance of wretched intoxication. His gait was staggering; his countenance, flushed; his speech, maudlin and incoherent, but not without a touch of humor; and his intellect, badly shattered, as if with habitual intemperance. Yet he was never, so far as the writer could learn, addicted to strong drink,

or partook of any stimulant which would cause drunkenness. The only explanation offered of his sad condition was that his mother, awhile before his birth, was startlingly impressed and to some extent alarmed by the appearance and conduct of a drunken man who attempted to force his way into her house.

A case is reported, on the authority of Professor Lewis of Bellevue Hospital, New York, under whose personal observation it came, of a child who was born with letters on the white of its eyeball, like those on the dial of a watch. The mother of the child, the wife of a humble workingman, had strongly desired a watch, during the period of her pregnancy; but her husband was too poor to gratify her wish.

Professor Dalton, in his "Human Physiology," a standard work highly esteemed by physicians, declares there can no longer be any serious doubt that "various deformities and deficiencies originate in certain cases from nervous impressions, such as disgust, fear or anger, experienced by the mother."

In view of these proofs that the mind acts, to no little extent, as a formative principle or determining force in the development of the body — by virtue of its intellectual and emotional states, irrespective of the will, — and that this is the case in the very incipiency of the body — the determining force proceeding either from the mind of the mother or possibly from the inchoate mind of the unborn child or

from both, — the following question may be asked: Is it unreasonable to presume that, in the animal world, the evolution of species (sometimes, and perhaps generally, after the development, in progressive order, with the aid of "natural selection," of several intermediate varieties, neither sufficiently differentiated from the former species to constitute a new one, yet each showing a peculiar adaptation to the conditions and circumstances of its daily life or of the range within which it is found) may be due, under divine law, primarily to the conception by its ancestral stock of the need or desirableness of such specific adaptation and to the earnest longing for its realization, — or to the conception, at least, of the fact of such adaptation, regardless of the mode in which it is brought about, and irrespective of any distinctive volition?

But it may be observed that changes in the vegetable world, of this nature, resulting in the production of varieties and the origin of species, appear to occur in the same manner as in the animal, — thus suggesting the inquiry, Why should we not attribute both to like causes or to the same cause? It should be remembered, however, that the life of the vegetable is, in some respects, essentially different from that of the animal; and therefore that it is not altogether warrantable to reason from one to the other. Vegetable life, for instance, is so constituted that it draws its sustenance, in a great measure, from the soil, or directly from mineral matter: while

animal life is incapable of this; although, in building up the body, it appropriates like chemical elements, but in different proportions and, in good part, from what has been prepared beforehand as vegetable matter and, in many instances, transmuted thence into animal matter before serving its present use as animal nutriment. It should be remembered also that, as we, ourselves, are of an animal nature, and therefore can enter, through our personal consciousness, into that which concerns the animal, — as we cannot into that which relates to the vegetable, — we can assert, of our own positive knowledge, the existence in the animal of certain mental processes, followed by certain transformations, as we cannot assert, from like knowledge, the existence of any similar processes and transformations in the vegetable.

Yet it is by no means certain that there is not, in the vegetable world, a low form of intellection equal to that which presumably exists, during a rudimentary condition, in the humblest of animal beings. We are told that "there is a living body, called *Æthalium septicum*, which appears upon decaying vegetable substances, and, in one of its forms, is common upon the surfaces of tan-pits"; and that, "in this condition, it is, to all intents and purposes, a fungus, and formerly was always regarded as such": but that it has been "shown that, in another condition, the *Æthalium* is an actively locomotive creature, and takes in solid matter, upon which, apparently, it

feeds, thus exhibiting the most characteristic feature of animality." *

Now, since naturalists regard its locomotion and feeding, in the last-mentioned condition, as of such a nature as affords conclusive proof of volition and intelligent purpose, can we assert, beyond a doubt, that, in the first-mentioned condition, or in its fungal state, it has no germ of intelligence, — or is inferior, in this respect, to an unborn living creature? It may be remarked that scientific investigators often have been troubled to determine, as respects certain low forms of life, whether they belong to the vegetable kingdom or to the animal, — and alternately have asserted the one and then the other.

A distinguished writer on natural history, Prof. Asa Gray, many years ago, remarked, in respect to the endowment of plants with life, that the distinction between plants and the lower animals . . . is "one of degree rather than of kind": that "many species of the higher grades (of plants) exhibit certain vivid motions, either spontaneous or in consequence of extraneous irritation; while the lowest tribes of aquatic plants, as they diminish in size and in complexity of organization, habitually execute, at some period at least, varied spontaneous movements which we are unable to distinguish in character from those of the lowest animals": that "it is at their lowest confines, accordingly, that the vegetable and

* Huxley, on the physical basis of life, — "Lay Sermons," etc., American edition, pp. 120–146.

animal world approach or meet, and even seem to blend their characters": that "probably life is essentially the same in the two kingdoms." *

Recalling again the evidence, already submitted, that *the mind acts involuntarily to no little extent as a formative principle or determining force in the development of the body — by virtue of its merely intellectual or emotional states, — and that this is the case in the very incipiency of the body — the determining force proceeding from the mind of the mother or possibly from the inchoate mind of the unborn child or from both,* — it may be asked furthermore: If we assume, in accordance with the claims of spiritual teachers, that the soul — or such part of our being as comprises the intellectual, emotional and volitional faculties — will survive the earthly body and attain to a higher state, in which it will be more richly endowed, have we no ground whatever for deeming it likely — or, at least, possible — that, in obedience to a law originally implanted in the constitution of man, it may be, in its glorified condition, the divinely appointed agent for clothing itself with a nobler body, bearing a likeness to the earthly, and being, as occasion may require, not less substantial, but grander in its attributes and suited to loftier spiritual needs, yet a body to which, under conditions voluntarily induced by the indwelling intelligence, mere physical barriers will present no obstacle (being even less obstructive than an ordinary transparent medium — such as glass, for

* Gray's "Structural and Systematic Botany," pp. 340–350.

instance — is to light or heat) and which voluntarily may be rendered perceptible or imperceptible to natural sight and touch? To this question, science can afford but a qualified answer. It may be observed however, that late researches in physico-psychology, in which many persons distinguished in the learned world have been concerned, present an impressive array of apparently well-authenticated facts showing that such a question — however speculative it may seem — is not altogether absurd; and that such a state of things is, by no means, beyond scientific possibility.

There are many theologians, it is well known, who maintain, as a matter of divine revelation, the doctrine of the resurrection of the body,— who also contend that it will possess, in its resurrected state, higher capabilities, suiting it to more exalted spiritual wants, and thus rendering appropriate its designation as a spiritual body; that, so endowed, it will be like the body in which Christ is believed to have manifested himself after his disappearance from the tomb: in other words, that it will present a likeness to the former natural body; may be seen, handled and felt; may move in a natural way; may be guided apparently by earthly senses; may breathe, talk and partake of food (not necessarily as a requisite sustenance); yet may be unrestrained by physical barriers, may supernaturally appear and disappear, and will not be subject to death or decay. In support of these views, they cite numerous passages of Scripture, including the following: I Cor. xv, 1–55; Jn. ii, 19–22,

— v, 25–29, — x, 17–18, — xx, 1–29, — xxi, 1–13; Lk. xxiv, 1–43; Mat. xxviii, 1–10; Acts ii, 22–32; Phil. iii, 10–11, 20–21.

Having thus far considered chiefly the involuntary influence of the mind over the body, and observed to how great an extent it acts as a formative principle, let us now turn our attention to its operations more particularly under the guidance of the will.

The human will, regarded in certain aspects, is the highest of the mental faculties. It calls others into exercise, diverts them from previous lines of thought, directs their course, — restrains the desire for immediate action, until reason and judgment have performed their tasks, — and finally issues its mandates, through appropriate nerves, to the members subject to its control. It is the executive of the brain, the helmsman in the voyage of life. Yet its authority does not extend to all the functions of the body; and, in respect to some which are largely submissive to volition, its power is limited. The beating of the heart is beyond its control; and the process of breathing, although subject to its regulation, cannot be long suspended by its dictates.

During the last half century, scientists have called attention especially to the fact that many movements of the body, apparently under the direction of the will, are accomplished automatically, or by reflex action.

As to what is meant by reflex action, both in man and in the lower animals, allow me — for the con-

venience of those who have never studied the subject — to call attention to the structure of the nervous system of a centipede, as illustrated by a diagram copied from one in Carpenter's "Mental Physiology" (page 51) and herewith shown, — and to present a condensed statement of Dr. Carpenter's explanation.

The white part of the diagram, except in the head of the creature, shows what is called the ventral cord. This cord, which runs along the lower part of the body, beneath the alimentary canal, consists of successive pairs of nerve-trunks, united at points opposite the legs by what are called ganglia. From these ganglia, two nerve-trunks on each side radiate laterally; and, from the ganglia in the neck, two nerve-trunks also extend to ganglia in the head, called the cephalic ganglia. The ganglia in the body serve partly as a means of connection for the nerve-trunks.

Through these nerve-trunks, there is transmitted, along certain interior fibers, to the ganglia of the head, the peculiar nervous influence which produces sensation. In response to this influence, and often — it is believed — *irrespective of any volitional prompting*, there is sent back, through the same nerve-trunks, but along other fibers, a reflex nervous influence, which produces motion. This process resulting in motion, as prompted

by the development of a returning nervous current, irrespective of volition, is termed reflex action.

The cephalic ganglia of the centipede correspond to the sensorium at the base of the human brain, in which the nerves of sight, hearing, smell, etc., terminate, — and, with the aid of which, sense-perceptions are effected. They are undoubtedly the seat of consciousness. They appear also to perform in some measure the same function as the cerebellum, or smaller part of the human brain, in regulating and coördinating or harmonizing the muscular movements of the creature — as, for instance, those of the legs in crawling and turning from side to side. But each of the ganglia of the ventral cord also ministers to the reflex action of its own segment of the cord, — and likewise, in some measure, to those of other segments. It appears, therefore, that it is not needful that the nervous current, originated by disturbing any part of the body, should extend to the head, or recognized seat of consciousness, in order to develop such a return current as will induce motion; for, as soon as it reaches any of the ganglia of the ventral cord, a current productive of reflex action forthwith sets in.

> Dr. Carpenter says*: — "If the head of a centipede be cut off whilst it is in motion, the body will continue to move onwards by the action of its legs; and the same will take place in the separate parts, if the body be divided into several

* Carpenter's "Mental Physiology," §54.

distinct portions. After these actions have come to an end, they may be excited again by irritating any part of the nerve-centers, or the cut extremity of the nervous cord. The body is moved forwards by the regular and successive action of the legs, as in the natural state; but its movements are always forwards, never backwards, and are only directed to one side when the forward movement is checked by an interposed obstacle. Hence, although they might *seem* to indicate Consciousness and a guiding Will, they do not do so in reality; for they are performed as it were 'mechanically'; and show no direction or object, no avoidance of danger. If the body be opposed in its progress by an obstacle of not more than half of its own height, it mounts over it and moves directly onward, as in its natural state; but, if the obstacle be equal to its own height, its progress is arrested, and the cut extremity of the body remains forced up against the opposing substance, *the legs still continuing to move.* If, again, the ventral cord of a centipede be divided in the middle of the trunk, so that the hinder legs are cut off from connection with the cephalic ganglia, they will continue to move, but not in harmony with those of the fore part of the body; being completely paralyzed, as far as the animal's controlling power is concerned, though still capable of performing reflex movements by the influence of their own ganglia, which may thus con-

> tinue to propel the body in opposition to the determinations of the animal itself. The case is still more remarkable when the ventral cord is not merely divided, but a portion of it is entirely removed from the middle of the trunk: for the anterior legs still remain obedient to the animal's control; the legs of the segments from which the nervous cord has been removed are altogether motionless; whilst those of the posterior segments continue to act, through the reflex powers of their own ganglia, in a manner which shows that the animal has no power of checking or directing them."

These facts, as set forth by Dr. Carpenter, respecting the centipede, strikingly illustrate the nature of reflex action; and show that movements which appear to be prompted by an intelligent will *may be* quite independent of consciousness, as it is commonly understood, — or, in other words, *may be* purely automatic.

Similar facts are observed respecting man. The process of swallowing, for instance, although apparently prompted solely by the will, is found to be chiefly the result of reflex action. What the will does is merely to incite a movement of the tongue, by which the substance to be swallowed is carried back so as to bring it in contact with the lining membrane of the pharynx. This contact causes the muscles of the pharynx to close around the substance auto-

matically, so as to carry it down into the gullet. In tickling the rear wall of the mouth with a feather, to induce vomiting, it has occasionally happened that the feather, being pushed too far, has been seized by the muscles of the pharynx and drawn from the fingers.

The process of sucking, in case of the infant, also affords an example of reflex action.

The movement of the human legs, in walking, doubtless is largely automatic. It is begun under the direction of the will; but is carried on apparently without such direction, except so far as is needful in varying the course or changing the length of the steps. Every one who has tried walking upon the sleepers of a railroad track, which are at unequal distances apart, knows the difficulty involved, from the necessity of careful observation of the requisite length of the step and of the constant regulation of such length by the will; and knows also how tiresome is such experience.

In cases of personal accident, causing injury to the spinal cord, it often happens that there is a paralysis of the lower extremities. But, even when there is a complete severance of the cord, if the lower part remains sound, and its connections with the legs, unimpaired, distinct reflex movements of the legs can be excited by a stimulus directly applied to them; and this has occurred without the patient feeling the stimulus or knowing of the motion. In a case of this kind, where the patient was asked whether he felt

the irritation by which the motions were excited, he replied, as he looked at his limbs and observed their movements: "No, sir; but you see my legs do." Various experiments, tried in similar cases, demonstrate the fact that the motions of the lower limbs of the human being are, in many instances, as much the result of reflex action as the continuous motions of the legs of the centipede, the head of which has been cut off while the creature is in the act of crawling.

Nearly all the internal processes of the body, such as digestion, glandular secretion and excretion, circulation of the blood, etc., are carried on by reflex action. In view of the great extent of such action, a few investigators and radical thinkers have inferred that even the promptings of our highest intelligence are the results of reflex action; and that man, on the whole, must be deemed a mere automaton.

A bold expression of this doctrine is found in a book, entitled "Letters on the Laws of Man's Nature and Development," by Henry G. Atkinson and Harriet Martineau, — in which the writer remarks: — "Instinct, passion, thought, etc., are effects of organized substances." . . . "All causes are material causes." . . . "In material conditions, I find the origin of all religions, all philosophies, all opinions, all virtues, all 'spiritual conditions and influences,' in the same manner that I find the origin of all diseases and of all insanities, in material conditions and causes." . . . "I am what I am, a creature of necessity; I claim neither merit nor demerit." . . . "I feel

that I am as completely the result of my nature, and impelled to do what I do, as the needle to point to the north, or the puppet to move according as the string is pulled." . . . "I cannot alter my will, or be other than what I am, and cannot deserve either reward or punishment."

Similar views have been expressed by other prominent writers.

In reply to such assumptions, it may be said: — (1) They are in direct antagonism to the fundamental convictions of every sane man that he really possesses a self-determining power which can rise above the promptings of circumstances, and that, instead of being ruled by them, he can shape them in good part to his own purposes. (2) He has even stronger evidence of the existence of this self-determining power within him, than he has of the existence of a material world without; since the will, itself, is a subject of internal consciousness — direct and immediate, — and not of perception through the organs of sense, which are in themselves, material. But a full discussion of the question, in a metaphysical way, is impracticable in the present paper.

I pass, therefore, to the consideration of the wonderful celerity of mental processes, under the guidance of the will, as they occur above the plane of automatism.

Mental processes often outrun the laggard pace of recording memory, so that little trace is preserved of the successive steps.

A striking illustration of this has been afforded in the quickness of some mathematicians, who could solve the longest and most intricate problems with lightning-like rapidity, but could tell nothing of the methods of solution. Such was the case with Zerah Colburn, who, from about 1810 to 1818, was exhibited in America and Europe as a mathematical prodigy.

The same was true of Truman H. Safford, who at one time was connected with the Nautical Almanac Office or Observatory at Cambridge, Mass., — and afterwards was a professor in Williams College. One of his associates at the Nautical Almanac Office told me that Safford often accomplished the most difficult astronomical calculations in two or three minutes and with infallible correctness; but that his mind was so quickly fatigued that, on the whole, he was able to do but little more than others, who wrote out their calculations.

About 1847 or 1848, an idiotic boy who evinced similar capability was exhibited in various parts of New England. He was advertised as the "Mathematical Fool" — his mind being so abnormally developed that it was as weak on other sides as it was strong on the mathematical.

But it is not merely in cases of abnormal development or of unusual genius that great mental quickness is shown. It is daily manifest under our observation and — as may appear upon reflection — in our own personal experiences. An illustration of this may be found in the readiness of the accomplished pianist,

in performing a piece of rapid music which he has never before heard or seen. His fingers move with such swiftness that they seem guided by intuition. The reading of the music and directing of the touch outstrips the process of chronicling memory; yet he observes and renders, with correctness, every relation of time, pitch and expression, however complex the harmony or peculiar the sentiment. Even the fire of the composer seems to run in his veins, and flash forth at his fingers' tips. Yet his action appears spontaneous. All this, however, is done under the direction of the will.

In ordinary reading, there is an observance of each letter, but no recollection of such observance as a distinctive act. Yet, if a needful letter is omitted, the lack is usually perceived at once. If the reader has been trained to the stage, and expresses the sentiment of what he reads, with appropriate voice and action, — analyzing each subtle emotion, and giving to it a living reality, — what a whirl of commingled thoughts, what a series of animate and inanimate pictures runs through his brain, beyond all power to hold in subsequent remembrance. Even the process of vocalization requires the most wonderful activity of thought and delicacy of perception. The myriad muscles of the lips, the tongue, the larynx, the thorax, the diaphragm, etc., all, move in harmony and in perfect obedience to the will for the production of the sounds; and who can tell with what wonderful play or with what infinite variety of expression?

I am well aware, it is contended by many writers, not materialists, that by far the greater part of this is automatic — the celerity and want of recollection of the successive steps being deemed evidence of reflex action not under the guidance of the will. But a comparison of facts which have come under my observation has led me to a different conclusion.

Among the reasons for deeming these processes only to a small extent automatic are the following: — The elements which they include are the result, in many instances, of considerate mental action; and are skillfully coördinated, arranged and harmonized. There is a selection of these elements; and this selection requires the careful consideration and rejection of other elements, as well as the preference of those which are employed.

To illustrate, let us refer again to reading or recitation upon the stage. For effectiveness in such a performance, there must be, *first*, a perception and appreciation of the thought and feeling to be expressed; *secondly*, a consideration and determination of what is the best method of expressing it with the voice — that is, with reference to pitch, volume, quality, inflection, rate of movement, rhetorical pauses, etc.; *thirdly*, a consideration of what is the best method of expressing it in action — that is, by attitude, gesture, bodily movement, and facial expression; and, *fourthly*, there must be observance of the audience, so as to determine whether the methods employed are producing the desired effect, and, if not,

what changes are needful, — also for the purpose of drawing inspiration from the audience, which, as every accomplished reader or actor well knows, is often exceedingly helpful. All these acts, it is plain, require intelligent perception, reasoning, judgment and will. From their very nature, they cannot be, to any great extent, automatic. To bring the results together and adjust and harmonize them so as to make an agreeable whole requires the exercise of man's highest powers, and is as far above automatism as the heavens are high above the earth.

It may be admitted, however, that the process is less complex, or extends in fewer instances to fundamental details, than it would be, if the reader or speaker were untrained as an elocutionist or an actor, or were unfamiliar with the piece and its rendering. Undoubtedly the conclusions reached by him, in former instances, as to what, under certain conditions, is desirable in respect to this or that, are extremely helpful, — and, being applied in the present instance to conditions partly the same or closely analogous, shorten the process, and enable him more easily and successfully to reach the desired result. Yet, while it hardly can be denied that some of his steps are but little else than automatic, it seems unmistakable that, on the whole, his process of perception, reasoning, discrimination, judgment and will, notwithstanding its swiftness, is so intricate as utterly to defy analysis and to baffle all attempts at intelligent description.

But it may be asked, if the acts are really performed in the manner specified, why have we no clearer recollection of them? I answer: — It is manifest from our daily experience that the human mind is so constituted that but few of its thoughts, except in their final results, can be retained in our ordinary consciousness.

Were all the thoughts of a life treasured up in the present memory, how cumbrous would be the store, and how few useful grains would be found in the mountain of chaff!

We see a new landscape, as we journey in a car; and are pleased with its features: but how little can we tell of it, an hour afterwards! Yet enough may be impressed upon our fleeting memory to enable us, even a year later, on seeing a picture of it, at once to recognize the view.

Certain streets in a large city are familiar to us. We have observed repeatedly the buildings fronting on them; but how few can we describe or tell much about! Yet, in some manner, there is hidden away in our minds such a delineation of them, in connection with their location, as to enable us to tell, from a faint glimpse of any small group of these buildings, even in the shadows of evening or in a fog, precisely where we are.

From facts like these, it appears that there are graven upon the hidden tablets of the memory such records of what we perceive and think as may prove useful to us when circumstances call for, and asso-

ciation leads to, their recollection. But it is certain that only a small share of all our thoughts remains available under ordinary conditions, or while we are in a normal state. Yet, strange to say, traces of even careless observation somehow linger in the archives of the memory, and become available under abnormal conditions.

Some years ago, I knew a lady who, while suffering with delirium, recognized the footfalls of any of her friends who approached the house, and told at once, with infallible correctness, who was coming; although, when in her normal state, she could not recognize such footfalls, and had no remembrance of ever heeding them.

Coleridge, in his Biographia Literaria, tells of a well-authenticated case — often cited of late years in works on psychology — of a young woman who could neither read nor write, but who, when her mind was unsettled by a nervous fever, repeated long passages in Greek, Latin and Hebrew, with much facility. It was found that, some years before, she had lived in the family of a clergyman, a learned man, who read aloud in foreign tongues, from ancient authors, as he promenaded up and down a way opposite the kitchen where she was employed. The passages she repeated proved to be those she had heard read. But, when in health, she had no recollection of them.

Such facts show that, notwithstanding our inability to recall the numberless steps incident to our processes of thought, especially when they are of great celerity,

we are by no means warranted in concluding that they do not occur. In the cases of the mathematicians, before mentioned, convincing proof that such steps were taken is afforded by their results in the correct solution of the problems; since no discovery was claimed of new methods by which the processes were materially shortened, and both Colburn and Safford unhesitatingly recognized the excellence of the old and familiar methods.

I have referred to the marvelous swiftness of thought in playing upon the organs of speech. We have little doubt that, in writing, all the motions of the hand and arm are under intelligent guidance, and that each muscle moves mainly as directed by the will, — being persuaded of this, partly because we see certain of the movements. But the more intricate movements of the muscles of the organs of speech are not seen; and, therefore, although each is accomplished at the bidding of the will, the process seems purely automatic. Evidently these movements are not instinctive, like those, to some extent, of the hands and arms in infants: for the modes of speech must be learned; they are not mere gifts.

The working of the mind, in its abnormal conditions, often reveals to us something of its higher capabilities. This is true in somnambulism, which, for many years, has been the subject of careful observation by physicians.

Some time ago, I knew a young lady who was a graduate in the collegiate department of Rutgers

Institute in New York City. During the latter part of her college course, she rose from her bed, one night, and translated with accuracy several pages of Sophocles, when in a somnambulic state, — turning to her lexicon for the meaning of a few unfamiliar words, and writing out the translation, in the midst of such darkness that her roommate was barely able to discern her movements. Not unlikely she was aided by an exalted sense of sight, resulting from nervous excitement induced by overwork and a slight illness.

There are many well authenticated cases of apparent vision, during somnambulism, when the eyes were closed or a screen was placed between them and the object which engaged their attention. Some of these may be explained by an exalted muscular sense, which — being attended with an exact recollection of the direction and extent of previous volitional movements — perhaps enabled the person to perceive, through the guidance of feeling, what he could not see.

Thus a young ecclesiastic repeatedly wrote sermons, in the dark, while in a somnambulic state: and occasionally he went back and corrected his manuscript; although a card was placed beneath his chin, so it was impossible for him to see where he was writing. The corrections, however, were made in the proper place. But when, during a pause in the writing, a sheet of paper like the one he had been using was substituted for the latter, he did not perceive the change, and marked his corrections on the blank

sheet in places exactly corresponding to those, where they were intended to be marked on the previously written sheet. On completing each page, he read it over aloud. It is not unlikely the words were seen only in imagination, and were repeated from memory, which was quickened by his peculiar nervous state. The exalted muscular sense, by which, it is presumed, he was enabled to mark the corrections, may have been of the same nature as that which — as a result of long training — guides the hands of skillful artisans in many of their processes or which directs the touch of musicians in playing various instruments — as the harp, piano and trombone, — also the same as that which guides the somnambulist or the rope-dancer in walking in dangerous places and preserving his balance.

The activity of the guiding senses of the somnambulist probably is enhanced, to some extent, by the fact that other senses are sleeping or inactive. In a case of somnambulism observed by Dr. Hammond, of New York,* the patient — a young lady — was insensible to the noise of two books struck together close to her ears, to the touches of a pencil upon her open eyes, to the fumes of a burning sulphur match and of smelling salts beneath her nose, and, temporarily, to lemon juice and a solution of quinine, placed in her mouth. "Scratching the back of her hand with a pin, pulling her hair, and pinching her face appeared to excite no sensation." Yet, "when the

* Hammond's "Sleep and its Derangements," pp. 207–209.

soles of her feet were tickled, she drew them away, thus showing that the spinal cord was awake." It is probable, therefore, that her actions were largely directed by the promptings of the spinal cord.

Dr. Hammond, who was formerly Surgeon-General of the United States, and is well known as a distinguished authority on nervous diseases, says: —

"Much observation and many experiments have convinced me that *the importance of the spinal cord as a center of intellection and volition has been unwarrantably ignored.* It is of course not a matter for doubt that the faculty of consciousness is latent in the spinal cord so long as the brain is in a state of activity, and that the faculty of memory does not reside in it at all. When the brain acts, it ordinarily assumes the control of the cord; but there are times, especially during the course of certain diseases, when the latter obtains the mastery over the superior organ and dominates with terrible power."

If these views of Dr. Hammond are correct, it is evident that some movements which originate in promptings from the spinal cord, rather than from the brain, are not merely automatic; since they are, to a certain extent, under the guidance of the will.

In mesmeric, hypnotic, and clairvoyant conditions of the mind, its most extraordinary manifestations are witnessed. I shall attempt but a slight discussion of these phenomena; and shall mention only a few facts concerning them, such as, I presume, will be generally conceded.

During the latter half of the eighteenth century public attention was pretty generally drawn to mesmerism, or to what is now commonly called hypnotism, — and again, to a greater extent, about the middle of the nineteenth century. Since then, its phenomena have been extensively investigated, and have been largely recognized in the scientific world. In many of the continental European countries, the belief in hypnotism has become so general that laws have been enacted forbidding its practice, except under the direction of capable physicians. Probably but few candid persons will deny that certain individuals possess what is called mesmeric or hypnotic power — that is, are able to establish abnormal sympathetic relations with others of a susceptible temperament, and to gain a peculiar ascendency over them. In some instances, the operator exercises this power, in a measure, over the movements of the subject, so as to cause such acts as the operator wills. In others, he so works upon the mind of the subject as to render certain senses inoperative or to impart to them a sympathetic susceptibility — making the subject capable, for instance, of tasting, smelling, or feeling, what is tasted, smelt, or felt, by another person at a distance. In still others, he appears to render the subject clairvoyant, or mentally capable of seeing objects beyond ocular vision and observing events which relate to them. Undoubtedly, in some of these cases, the subject may be aided by slight indications or suggestions from the operator, such as,

in the normal state, would be of little or no avail. In other cases, there appears to be transferred to the mind of the subject such knowledge of the matter as is possessed by some other person or persons at a distance, with whom the subject seems to be in sympathetic communication, — yet without any means, appreciable to the senses, of gaining such information. In a considerable number of cases, however, the subject appears to be fully capable, by his or her unaided faculties, of discerning what is beyond the reach of the senses and, so far as can be learned, is absolutely unknown to any other human being.

But there has been so much imposture in the professed exercise of mesmeric power that the public generally have been skeptical about it; and individuals have ceased to doubt, only as they have learned of its manifestations by those in whose honesty they had implicit faith, and as the manifestations and their results have been tested and apparently proved by rigorous scientific methods.

The investigations of the Society for Psychical Research — which includes many distinguished men both in Europe and America, and at the head of which, for some time, was Dr. Henry Sidgwick, Professor of Moral Philosophy in Cambridge University, England * — have done much to eliminate from the

* Among others who have been president of the Society are Prof. Balfour Stewart, F.R.S.; Rt. Hon. A. J. Balfour, M.P., F.R.S. (prime minister of the British Empire, after July, 1902); Sir Wm. Crookes, F.R.S. (inventor of the Crookes Tube); and Prof. Wm. James of Harvard University.

lists of such cases those which were clearly open to suspicion, and to establish upon a stronger foundation those which appear to be trustworthy. Of the work of this society, Mr. Gladstone remarked: "It is the most important which is being done in the world, by far the most important."

An illustrative case of what may be deemed clairvoyance, which seems to be fairly proved, is related in the appendix to Wayland's Intellectual Philosophy. It is that of a colored man on the United States Steamer *Princeton*, who was repeatedly mesmerized, in the year 1874, by J. M. Brooke, a well-known reputable officer in the navy. While in the mesmeric state, the subject told correctly of incidents occurring at a distance on shore, related conversations connected with them, and described even the contents of men's pockets.

Richard Hodgson, LL.D., the secretary of the American Branch of the Society for Psychical Research, placed in my hands some time ago a little book, entitled "X + Y = Z, or the Sleeping Preacher," giving an account of abnormal powers, shown in a sleeping or trance state akin to the hypnotic, by Rev. C. B. Sanders, a Presbyterian minister of good standing in the Southern states. The genuineness of these manifestations is vouched for by nearly eighty persons, whose names and residences are given in the book. The list of witnesses includes seven physicians and ten clergymen of various denominations, some of high repute. In answer to an inquiry of Dr. Hodgson

whether he had corresponded with any of these witnesses — the names of several of whom, I noticed, had a pencil check-mark before them — he addressed to me this letter:

BOSTON, MASS., April 5, 1893.

DEAR MR. MORGAN:

The names marked in the copy which you have of X + Y = Z are those with whom I have had special correspondence concerning the case; the other names in the list have all been written to and replies received from most of them. We have letters also from other people of prominence who testify to the accuracy of the statements contained in the book. I think there is no doubt as to the absolute integrity of the several witnesses.

Mr. Sanders is now in Texas.

Yours sincerely.

R. HODGSON.

Concerning the esteem in which Rev. Mr. Sanders was held, it was said that his standing as a member of his Presbytery had been maintained without blot or reproach, and that he had shared all, even the highest, honors in the gift of the Presbytery.

When he was in a trance state, into which Mr. Sanders seems often to have passed unawares and irrespective of any outward influence, it is reported that not infrequently he saw objects and heard conversations in places toward which his attention was turned, far beyond the normal reach of his senses, that on some occasions he showed a good understanding of languages he had never learned, and that sometimes he wrote in such languages. It is said

also that, while in the trance state his conversations and religious discourses often were remarkable, and that he wrote a good number of volumes which have been published and considerably circulated, some of them treating successfully of matters about which, when in his usual condition, he had little knowledge.

Among other striking facts, told of Mr. Sanders, is, that, many times, while in his abnormal state, he discovered lost articles, quite hidden from his natural view and far beyond the range of his normal perceptions, of the missing of which it does not appear from any statement contained in the book that he had a previous knowledge, and as to the loss of which no inquiry seems ever to have been addressed to him. In some of these cases, he described, before their recovery, the exact location, position, and appearance of the lost articles. In none of the instances just referred to, does it appear that any one else knew of the whereabouts of the things lost, so that Mr. Sanders could have been aided in his discovery, by telepathy, or thought-transference, working as commonly supposed.

The records of the Society for Psychical Research present other cases, seemingly well authenticated, of clairvoyant vision similar to Mr. Sanders', in which it does not appear that the observers could have been aided in the least by telepathy. To what extent the investigations of the Society or its members may be regarded as absolutely confirmatory, in these cases, time alone probably will tell.

Of the power of one mind over another, which

apparently may be exercised in an abnormal way, permit me to mention a single instance.

Some years ago, an article appeared in one of our leading magazines, containing an account, written by an officer of the United States Army, of a trial of powers between two Indian medicine-men. Each was widely famed. They met in answer to a challenge, and sat down, face to face, in the midst of a circle of assembled warriors. Each remained for some moments, with his gaze riveted upon the other. Suddenly the elder, straightening his form and waving his hand with an authoritative gesture, commanded the other to die. His antagonist fell over, and in a few moments expired. I do not know how far this seemingly incredible story may be vouched for; but, if true, it certainly presents a most remarkable instance of the supremacy of one mind over another, extending even to its vital relations with the body.

It may be observed, however, that death sometimes follows extreme fright and is believed to be caused by it; and, therefore, as fear often is greatly increased by superstitious dread of the exercise of some occult power, the above-mentioned fatal incident may not be deemed wholly improbable, especially if it be admitted, as likely, that a strong hypnotic influence was exerted by the victor in the contest. Yet it is scarcely presumable that an Indian medicine-man who had gained much influence with his tribe would be easily overcome through fear.

In conclusion, I call attention to the fact that,

unless we reject a mass of evidence respecting hypnotism, telepathy and clairvoyance, which seems peculiarly difficult to controvert, we must admit that the mind or soul sometimes appears to be operative beyond the body — occasionally at very remote distances, or far outside the range of perception with the senses — and that it shows, not only an almost incredible discernment, but a power, of which, under normal conditions, it is utterly incapable. And, if we accept such evidence as conclusive, may we not regard it as forming an important link in the chain of testimony that the soul is not wholly dependent upon the body; that it may become lastingly operative beyond its usual abode; that it will survive the body; and that, when released from its tenement of clay, it will rise to a higher state of being: moreover, is it too much to believe, that, in the providence of God, this link may have been supplied at an opportune moment when the foundations of religious faith are so ruthlessly assailed by materialistic philosophy? Let the future answer!

IV

THE WORLD OF INVENTION

The march of civilization is the march of invention.

Since man was driven from Paradise, he has sought to recompense himself for its lost joys and to escape the curse pronounced upon him — "In the sweat of thy face shalt thou eat bread" — by multiplying inventions which will minister to his gratification or relieve him from burdensome toil. His clothing, his shelter, his household conveniences, even the book which improves his mind or points out to him the way of eternal life, all, bespeak invention.

Were the natural world our only possession, our condition would be but little above that of the brute. Take away every invention of the human mind, and we should again stand naked before our Maker, limited to such lands only as are favored by tropical warmth, the seas impassable before us; we should dwell in caves and dens of the earth; should be compelled to subsist on spontaneous fruits; and should have no knowledge of the past but from slender traditions, and no light for the future except from divinely implanted intelligence. Our struggle with Nature would begin anew, the beast of prey would be our continual adversary, and we could hardly claim supremacy over the horse or ox.

Truly the world of civilization is a world of inventions.

The ancients recognized this, even in their religions. In the Greek and Roman mythologies, Athena (or Minerva) — believed to have been born from the head of Zeus (or Jupiter), the supreme deity — was worshiped as the goddess of the arts — herself, a prolific inventress. The plow, the chariot, the sailing vessel, various instruments of martial music, fabrics of spinning and weaving — in fact, nearly all the early products of feminine art — besides a multitude of other ingenious devices, were attributed to the wonder-working goddess. Lavish in her bounties and ever mindful of the public weal, she was adored as the preserver of the state and of all which gives to it strength and prosperity. In the plenitude of her power as its defender, she was worshiped also as the goddess of war. As the representative divinity of wisdom, typified by the immeasurable excellence of her gifts to man, she was regarded as sitting at the right hand of Jupiter and supporting him with her counsels.

Similar faiths were entertained respecting other divinities. Hephæstus (or Vulcan) was worshiped as the celestial artificer, the contriver of an infinite variety of useful and beautiful works, the architect of the heavenly abodes, the fashioner of Jove's thunderbolts, as the god of fire (the most potent agent known to the ancients for transforming material substances) and as the instructor of men in the ornamental arts.

Hermes (or Mercury) also was honored as a divine

inventor. The alphabet, the expression of numbers, weights and measures, the arrangement of sounds in melody, the harp in its pristine form — consisting of cords stretched across the concave shell of a tortoise — the syrinx, or Pandean pipes, and many other highly esteemed and curious inventions were believed to have been the gifts of this cunning deity.

Thus it was a deeply rooted faith of the ancients that even the gods delighted in inventions, and imparted them to mortals as their choicest boons.

Traces of this superstition lingered long after the old mythologies were swept away. Among the disciples of alchemy, it was believed that, before the flood, the secrets of their art were communicated by angels to divinely favored persons, but that these secrets perished with the Deluge or with the death of those who had survived in the ark. The Scripture record of the great age of some of the antediluvians as, for instance, Adam, Seth, Enos, Cainan, Jared, Methuselah, and Noah, all of whom, it is said, lived to be over nine hundred years old, gave ground for a supposition that, through the blessing of the Almighty, there may have been revealed to them some potent drug by which their lives were wondrously prolonged. Such a drug, known as the Elixir of Life, was the object of the most persevering search by the alchemists through many centuries. To this search was allied that for the Philosopher's Stone, which was believed to have the power of transmuting the baser metals into gold; also the search for a mysterious recep-

tacle and fluid constituting the imaginary Eternal Lamp.

It is not surprising that, secluded in their dark laboratories, striving to penetrate the secrets of Nature and find out such wonders, the alchemists were sometimes led to invoke the aid of spirits from the nether world and to indulge in the practice of forbidden arts. Hence they repeatedly fell under the ban of the Church, and in some instances were put to death. Yet, in many cases, they secured the favor of sovereigns and princes who hoped to be enriched by their discoveries. The history of some of them — for instance, of Count Bernard of Treviso, and of Sir Raymond Lully — reads like a romance. Lully, who was an accomplished courtier, enjoyed the favor alternately of James II of Aragon and Edward II of England. The latter monarch, in consideration of Lully's engaging, through the Abbot of Westminster, to supply him with gold by the exercise of his mysterious art, promised to undertake a crusade for the recovery of the Holy Sepulchre. Rooms were assigned to the alchemist in the Tower of London, and there, according to his own story, he transmuted fifty thousand pounds weight of quicksilver, lead and tin into pure gold, which was coined at the mint into six million nobles — the equivalent of $90,000,000. But Edward II never saw fit to undertake the crusade, and Lully, after being detained awhile as a prisoner in the Tower, made his escape and fled to Jerusalem and subsequently to Tunis, where he was stoned by

Mohammedans, and, although rescued from their hands, soon afterwards died of his wounds.

But the researches of the alchemists, notwithstanding their visionary purposes, resulted in many important discoveries and inventions — among the latter, the retort, the alembic and the crucible — and taught the use of many serviceable processes, such as distillation, sublimation, filtration, and crystallization. Yet their art was commonly allied, in the public mind, to that of the magician and necromancer.

As the alchemists were supposed to be assisted in some instances by evil spirits, so other experimenters and inventors who accomplished surprising results were presumed to be aided occasionally by the powers of darkness. In the thirteenth century, the inventor of a flying machine was held to be in league with Satan, and was burned alive by order of the Holy Inquisition. Another inventor, for making an automaton writing boy, was seized by officers of the Inquisition and barely escaped with his life. In the seventeenth century, Alex of Provence, who invented an automaton guitar-player, was condemned for witchcraft, and was burned, together with his invention, by order of Parliament.

The early inventors, with few exceptions, received but little encouragement. There were no laws protecting them in the exclusive right, for a time, to the fruits of their ingenuity. Hence they often sought protection in secrecy, and thus increased the suspicion of their being addicted to evil arts. This suspicion

was intensified, in some cases, by the open accusations of those with whose industries, conducted according to old methods, their inventions interfered. The working classes frequently were inflamed against them, through fear of privation of employment by the introduction of their labor-saving contrivances. This fear, however absurd it now seems, was shared in, sometimes, by intelligent rulers, who were averse to any change likely to disturb their subjects and to create popular discontent.

When William Lee, a poor curate in Nottinghamshire, had invented the stocking frame, in 1589, he brought it to London, and, having set it up in his lodgings, prevailed upon Queen Elizabeth to do him the honor of inspecting it. Her Majesty, it is reported, was accompanied by Lord Hunsdon, who urged her, of her royal pleasure, to grant a patent for the invention. The Queen is said to have answered: "My lord, I have too much love for my poor people who obtain their bread by the employment of knitting to give my money to forward an invention that will tend to their ruin by depriving them of employment and thus make them beggars." Lee afterwards took his stocking-frame to France, where he was promised the favor of Henry IV; but, the king being assassinated, the inventor was doomed to a second disappointment. Later, James I, of England, refused him a patent; and Lee, at last, sorely impoverished, fell a prey to dejection and lost his life. Thus one of the most valuable inventions which has been given to the world failed

to bring to its originator either a grateful recognition or an honorable reward.

Not far from this time, or in 1624, the first emphatic assertion was made, by a general public enactment, of the right of an inventor to protection in the exclusive enjoyment of his invention for such a term of years as would assure to him a reasonable recompense. This enactment was the famous Statute of Monopolies, passed in the reign of James I. It must be regarded as the beginning of our modern system of patent law. Observe that it was not until four years after the landing of our pilgrim forefathers at Plymouth that it had its origin in the mother country. But, although called the Statute of Monopolies, it was not so much an act for creating exclusive privileges as for limiting them to cases in which they were founded in natural right or were obviously for the benefit of the realm. If a person had given to the world, through the exercise of his ingenuity or original thinking, that which was new and useful, he was regarded as having a just claim to recompense. While, therefore, the statute favored the issue of letters patent securing sole and exclusive rights for a limited period to inventors, authors, etc., it declared various other monopolies, such as had been created by royal authority for the benefit merely of favorite subjects, contrary to law and thereafter to be deemed "utterly void and of none effect." It is true that patents for inventions had been granted before, according to the royal caprice. But, since they had been upheld in all just

cases by the common law courts, the claim to such patents, whenever the inventions were new and useful, was now asserted as a common-law right. The Statute of Monopolies, therefore, being declaratory of the common law, placed such patents under the protecting ægis of the British Constitution, and established the right to them not less firmly than the right of trial by jury.

This statute marks an important epoch; since the protection thereby assured to inventors proved wonderfully helpful to progress in the useful arts. It was the result of a growing spirit of self-assertion, and an increasing demand on the part of British subjects for the recognition of their fundamental rights. Would time permit, I should be pleased to trace in detail the historic causes which led to its enactment. Several are of interest as originating partly in the progress of the arts themselves. But I can only touch upon them.

First, and perhaps most important, was the invention of the art of printing with interchangeable types which could be variously set and reset as at the present day. It originated in 1444. The first volume resulting from it is said to have been the Mazarin Bible, in the Latin tongue. This was followed by the Psalter and shortly afterwards by other publications, including " The Appeal Against the Turks," then, as now, regarded among the most implacable enemies of Christendom.

The art of printing made rapid headway, being promoted by the Revival of Learning which, twenty

years later, broke the night of the Middle Ages and created an immediate and urgent demand for books. It is undoubtedly true that the Revival itself was materially helped by the extraordinary cheapening in the cost of books, which resulted from the improvement in the art of printing and from various inventions and improvements in the manufacture of paper that afforded a substitute for parchment or vellum. Books could now be placed in the hands of the common people, or of men of moderate means.

The period of the Revival of Learning dates from soon after the capture of Constantinople by the Turks, in 1453, and the expulsion of its Greek scholars from the late capital of the Eastern Empire. Fleeing into Italy, these scholars established flourishing schools, particularly at Florence, where an acquaintance was imparted with Greek philosophy, poetry, etc., and a thirst was created for classic literature. The demand for this literature was readily met by the new arts in book-making; and, in a brief interval, there was a wonderful dissemination of knowledge.

Printing by the new mode was at first conducted with secrecy: but, in 1462, when the city of Mentz — where the printing offices of the inventor, Gutenberg, were located — was besieged and captured, the business was temporarily broken up; and the printers were soon scattered into other countries. In 1465, the art was introduced into Italy; in 1469, into France; in 1474 probably, into England; and

in 1475, into Spain. It is said that, throughout Europe, between the years 1470 and 1500, ten thousand editions of books and pamphlets were published — the most important part of them in Italy. Before the close of this period, all the Latin authors, and, in the next twenty years, nearly all of the more valuable Greek authors, were made accessible to every student.

The profound influence of the burst of these two great classic literatures upon a reawakened world can hardly be measured. To appreciate it, one must bear in mind that, just prior to this, learning in Europe was nearly at its lowest ebb. A competent critic has remarked that no original books of any value, save those of Sir John Fortescue and Phillipe de Comines, had been produced north of the Alps during the fifteenth century.

When Caxton's Press was established in England in 1474, the number of students at Oxford University was but a fifth of what it had been a century earlier; "Oxford Latin," we are told, was "proverbial for a jargon in which the very tradition of grammar had been lost." Yet, in less than a generation, the students both at Oxford and Cambridge had greatly multiplied, and Latin and Greek, of remarkable purity, were taught there by competent professors. Not only this; but, to a creditable extent, education had been carried to the middle classes, or to those below the rank of professional scholars.

The human mind, through a great part of Europe,

was wonderfully quickened, and turned with eager interest to nearly every branch of knowledge.

We have already noticed that the first product in book form of the modern art of printing was the Mazarin Bible in Latin. Less than a century thereafter, translations of the Bible into various European languages were published, and were distributed to a considerable extent — at least as respects the New Testament — among the masses, especially of England and Germany. Stimulated by their potent agency, the Protestant Reformation had reached its height; and, as a result of the discussions which it engendered, there had been a marked uplifting of the Catholic clergy in both intelligence and commendable discipline.

The publication of King James' version of the Scriptures, which was read by all classes, did more than anything else to fix the English language in its present form and to render it as little subject to change as the increase of knowledge and the demands of a growing civilization would permit. Yet, before this, and helpful to the same and other noble ends, there had been the upgrowth in England of a generous literature such as was rendered practicable, doubtless, only by improvement in mechanical facilities for the production of books and for their supply at small cost to a multitude of readers.

And what a literature was this! Notice the fact that it includes preëminently that of the Elizabethan Age of England, presenting the names of such authors

as Sydney, Spenser, Shakespeare, Bacon, and Ben Jonson — a literature unrivaled in some respects by any that has followed. Observe too that it all came after a period of extraordinary intellectual dullness and within less than a century and a half of the introduction of Caxton's Press into England.

Summarizing the great events which were wonderfully promoted, or rendered possible only, by Gutenberg's invention of the art of printing — and each of which marks an epoch in the world's history, — we notice that they include the Revival of Learning, the Reformation, the Development of Elizabethan Literature, and the Fixing of a Standard for the English Language. Others, hardly less important than the two latter, occurred on the continent of Europe. But for this invention, none of these events, perhaps, would have fully transpired down to the present day.

What, then, shall we say of the influence of Gutenberg's invention? Was it less important than that of any great conception which has ever occurred in the world of thought? It may be answered: It was but a simple idea. True! But the world had waited for it over fifty centuries; and its coming, at once reft the darkness of the Middle Ages and let in a flood of light which caused the human intellect to glow and corruscate as never before. It gave wings to thought; and sent forth innumerable messengers, as from celestial abodes, inviting man to rise up, and stand forth again, in the image of his Maker.

But were there no other inventions, about this time,

which contributed effectually to the awakening of the human mind and the quickening of material progress?

A little more than a century earlier, Flavio, a native of Pasitano in Italy, is said to have perfected the mariner's compass, or to have developed it by important improvements, and to have brought it to the favorable notice of navigators. Prior to this, the magnetic needle had not been trusted in venturing far upon unknown seas; but now, it gradually came into use.

An adventurous mariner of Genoa, relying upon its guidance and on the aid of the astrolabe (a lately invented instrument for measuring the altitude of heavenly bodies) and being convinced, by the study of charts and by speculative considerations, of the existence of a way across the western seas to the Indies, determined to find this way, braving the dangers of the trackless ocean, and to trust for his reward to the discovery of new lands. Through eleven years, he sought aid for his enterprise from various sovereigns; until at last the queen of Spain lent a favorable ear. In August, 1492, Columbus set forth on his voyage; and, on the 12th of October following, discovered the New World. This event occurred but thirty-nine years after the capture of Constantinople by the Turks and the flight of its Greek scholars to Florence. It created a profound sensation throughout Europe, and awakened an expectancy which resulted forthwith in other voyages of discovery and exploration. In 1497, John and

Sebastian Cabot found their way across the North Atlantic to Labrador and Newfoundland; and, in the same year, Vasco da Gama, a Portuguese navigator, rounded the Cape of Good Hope and entered the Indian Ocean. These and other discoveries following in quick succession turned the minds of men to new and wider fields, and begot hopes which were a powerful incentive to exploration.

In the midst of the growing thought, Copernicus, a Polish scholar, turned his attention to the heavens, and announced his theory that the earth is but a revolving planet, moving in a definite orbit around the sun as the center of a system which includes other planetary bodies moving in similar orbits. The Copernican theory was opposed to the long-accepted Ptolemaic theory; and provoked much controversy. For a time, it was rejected by many astronomers, and was denounced by the clergy of the Romish Church, as contrary to their interpretations of the Holy Scriptures. A little more than three-quarters of a century later, it found confirmation in the discoveries of Galileo. A new instrument had been invented by him, by which the firmament, itself, was wonderfully enlarged. It was the telescope, first constructed in 1609. Conceive the astonishment of the world when told by Galileo, for the first time, of myriads of stars before unseen, of mountains and valleys in the moon, of the peculiar appearance of Saturn — due to its rings, — and of four moons or satellites revolving around Jupiter.

But, as Galileo advocated the Copernican theory, he was brought before the Inquisition, was compelled publicly to renounce his asserted belief, and for a time was imprisoned.

But the world of thought moved on. With the discovery of new continents and new stars, the universe seemed immeasurably expanding; and men began to question as never before, and to wonder what announcement would next startle them from their imperfect realizations.

Is it surprising then that, with such enlargements of the fields of knowledge, with such added stores of learning, and with such a quickening of the human intellect — all, within a century and a half, — and with a realization by the world of its deep indebtedness for these blessings to the great inventions before mentioned and especially to the labors of authors in multiplying books, — some one of the enlightened nations should have thought it desirable at last to encourage and protect inventors and authors by carefully securing to them a property right in their own productions? We are happy to say that the advantage of such encouragement and protection was first recognized broadly by practical England, the land of our forefathers. Hence, the important reservations which were made in the British Statute of Monopolies respecting letters patent for inventions and copyrights for books and other literary productions.

The beneficial influence of this statute — enacted in 1624, or in the 21st year of the reign of James I —

was soon felt; although, as respects inventions, it was not strongly marked until nearly a century later, a fact partly due, perhaps, to the manner in which the law was viewed by the courts.

The most striking progress in the world of inventions has been made since the year 1750.

About the year 1764, James Watt began a series of improvements in the steam engine, rendering it so serviceable for general application that he has since been deemed substantially its inventor. The most important of these improvements was the double acting condenser. Other engines driven by steam had existed before — for instance, Newcomen's, — but they were so crude and imperfect as to be of very limited use.

The history of steam inventions is exceedingly interesting. Their name is legion, and a mere outline of them would fill a cyclopedia. The most important in their fundamental relations are those of George Stephenson, who is deemed the chief inventor of the locomotive, and of Robert Fulton, the inventor of the steamship. Among the most noticeable features of Stephenson's invention were the multi-tubular boiler, the device for discharging waste steam into the smoke-stack — thereby increasing the draft and causing a quicker combustion of fuel, greater heat, and more rapid making of steam, — direct communication between the steam cylinders and the wheels

rolling on the track — thus saving power, — and joint movement of the wheels, secured by horizontal connecting rods. Fulton's invention related chiefly to the adaptation of the engine to the hull of a vessel constructed for its accommodation and to the connection of the engine with a suitable crank-shaft for the paddle-wheels.

The gain to the world from the invention of the steam engine and from its employment for railroad and navigation purposes and its use in thousands of industries is inestimable. Attempts have been made in various ways to indicate it, but with only trifling success. Before the beginning of the last quarter of the nineteenth century, it was said that the steam power of Great Britain alone was equal to the power of 400,000,000 men. Think what marvels this potent agent performs in the place of human toil, — how it multiplies products for our enjoyment, annihilates distance, brings remote nations into close intercourse, and promotes exchanges between distant climes, — how it opens the wilderness to the transforming hand of man and carries civilization into the but lately accessible interior of continents, — in short, how it broadens the touch of humanity and links man to man in universal brotherhood. Do we realize that it has metamorphosed the world in but little more than a century? And shall we wonder that men have called the present " The Age of Steam "; and that the poet personifies this mysterious power, and gives it voice in song?

" Harness me down with your iron bands,
Be sure of your curb and rein;
For I scorn the power of your puny hands
As the tempest scorns a chain.
How I laughed, as I lay concealed from sight
For many a countless hour,
At the childish boast of human might
And the pride of human power!

" When I saw an army upon the land,
A navy upon the seas,
Creeping along, a snail-like band,
Or waiting the wayward breeze, —
When I marked the peasant faintly reel
With the toil which he daily bore,
As he feebly turned at the tardy wheel
Or tugged at the weary oar, —

" When I measured the panting courser's speed,
The flight of the carrier dove,
As they bore the law a king decreed,
Or the lines of impatient love, —
I could not but think how the world would feel,
As these were outstripped afar,
When I should be bound to the rushing keel
Or chained to the flying car.

" Ha, ha! they found me out at last,
They invited me forth at length;
And I rushed to my throne with a thunder-blast,
And laughed in my iron strength.

. . . . . .

" Hurrah, hurrah! the water's o'er,
The mountains, steep, decline;
Time — space — have yielded to my power, —
The world, the world, is mine.

. . . . . .

"The ocean pales, where'er I sweep,
To hear my strength rejoice;
And the monsters of the briny deep
Cower, trembling, at my voice.
I carry the wealth and the lords of earth,
The thoughts of the god-like mind;
The wind lags after my flying forth,
The lightning is left behind."

. . . . . .

I should be glad to speak of numerous marvels of invention, but must indulge in the mention of but few.

Let us consider for a moment the machinery for manufacturing fabrics of cotton, wool, etc. Nearly all that is driven by steam or water power has been invented since about the middle of the eighteenth century. Look for an instant at the railway spinning-frame, popularly called a mule. Observe the amazing ingenuity of its construction, by what seeming intelligence it is guided, and how deftly and delicately it accomplishes its work. A single person tends it with little labor. Yet it spins 1500 threads at once, and turns off 7,000,000 yards a day. How harmoniously the massive structure moves, and in what graceful measure! How beautiful, its rhythmical action! It is an epic poem in iron and steel; its verse is heroic. And of what does it sing? It sings of a band of inventors who set sail on a new Argonautic expedition in search of a golden fleece. It tells of their hopes, their ventures, their heroic struggles, and their occa-

sional defeats; it recounts their dalliances, the fatal spells sometimes cast around them, and their fortunate deliverances; it celebrates their combats and victories; it chants the requiem of their lost companions; and it proclaims the final triumph when the dragon which so long opposed them was slain and the glittering prize was won.

Few great inventions are the product of a single mind or the embodiment of a single conception. They are built up of improvements, piled one upon another and supplanting former improvements. They are the result of many trials, experiments, partial successes, disappointments and ultimate victories. The number of patents taken out for machines of a single class or to accomplish a single purpose bears abundant testimony to this. In 1888, the number which had been procured for spinning machinery, alone, was more than a thousand; for looms, over twelve hundred.

The expenditures of inventors in developing machinery up to the point of practical success are sometimes enormous. It is said that not less than $10,000,000 were spent in the construction of wool-combing machinery, before it afforded a satisfactory result. Without the encouragement afforded by patent laws, no such attempts would ever be made.

But while the outlay in experiments is frequently large, and often results in failures, the successes are sometimes extremely profitable. Sir Henry Bessemer spent over $100,000 in perfecting his process for

making Bessemer steel; but the profit realized made him more than a millionaire.

Most of the benefit from inventions accrues to the public; and consists chiefly in economical savings, especially of labor. The saving by improvements on the wooden plow of a century ago amounts, in the United States alone, to more than $50,000,000 a year. Yet the first of these improvements met with much disfavor. There was an absurd notion that a cast-iron plowshare would poison the land. The saving by the use of the cultivator is not less than $40,000,000 a year; by the use of harvesters, probably $100,000,000 a year. From such facts, we see how the productive wealth of the nation has been increased by labor-saving inventions. It is not surprising therefore that the United States, with its extensive territory and its unrivaled progress in the field of invention, has already acquired a wealth exceeding that of any of the older nations of the globe.

During the Colonial Period, the patent laws of England were operative in our own country: but were of no great account; since our forefathers were conquering the wilderness, and did but little for the development of manufactures. Yet a good number of patents were granted in the colonies. When the Federal government was organized, its framers, mindful of the protection of inventors and authors, provided in the National Constitution that Congress should have the power " to promote the progress of science and useful arts by securing for limited times

to authors and inventors the exclusive right to their respective writings and discoveries." But it was not until the year 1790 that the first statute was passed respecting inventions. It was inspired by Thomas Jefferson; who, it is said, may be justly regarded as the "Father of the United States Patent Office." It was more liberal than the English law; since it required no larger fees than were deemed necessary for the current expenses of the office. We are told, Jefferson took great pride in the establishment of our patent system, and gave his personal consideration to every application for a patent that was made from the year 1790 to 1793; that when an application for a patent came, he would summon, as members of an examining board, Henry Knox of Massachusetts, who was Secretary of War, and Edmund Randolph of Virginia, who was Attorney-General, — and, acting with them, would inquire into the case and determine the novelty and utility of the invention.

In the year 1793, the original statute was amended; and it has since undergone various modifications. But it has always remained of a liberal character, being in this respect unrivaled, till within a few years, by the patent law of any other country. Undoubtedly the remarkable progress of the United States in the useful arts is largely due to the generous provisions of this statute. During the first ten years after the enactment of our original patent law, the whole number of patents issued in this country was only 250; since about 1881, it has been over 15,000 a year.

The variety of inventions for which patents are sought is wonderful. They relate to nearly every branch of industry and almost every convenience. Some are of the most radical character, and are of the utmost utility; others are trivial, and, in a few instances, ludicrous or amusing. The latter include, for example, a machine for forcing hens to lay eggs, a device for ridding cheese of skippers, a mode of cooking stale eggs so as to make them eatable, a cow's tail holder to keep the fringe of the tail out of the milk-maid's eyes, a device for preventing snoring, a nose improver, and an automatic sheet-iron cat.

A brief description of the latter may be interesting. It is said to be moved by clock-work, and provided with steel claws and teeth. A bellows inside swells up the tail to a belligerent size, and a tremolo attachment causes the cat to emit noises as hideous as those of any veritable night-prowler. Placed in the yard or set upon the roof of a city house, it is said that he invites attack from the neighbors' cats; and that no sooner does he feel their weight than his teeth and claws work with startling rapidity and he is soon master of the field.

The value of our American patent system has been widely recognized, and has led to the amendment of the patent laws of many other countries. This result has been brought about largely by the attention which was directed to the progress of the useful arts in America, by our Centennial Exhibition, following

which, various foreign representatives urged upon their governments the importance of improvements in their patent systems.

In conclusion, let me ask your attention to the dignity and grandeur of the mechanic arts; to the fact that they afford scope for the noblest thought and the most beneficent attainments in knowledge, and that, through their intelligent exercise and improvement, blessings have been conferred upon mankind equal to those received through any other agency except such as immediately affects our spiritual welfare.

V

ENGLISH AND AMERICAN PRONUNCIATION

In the summer of 1891, I met, in the City of York, England, many members of the British Archæological Society, one of the principal learned bodies in Great Britain. The society was holding its meetings there. The Marquis of Ripon was at its head; and the members were men of more than average culture. Regarding them as at least fairly representative of the educated classes in our ancestral isle, I listened attentively to their conversation, and gave especial heed to their pronunciation. I was curious to learn whether there was really any such difference between cultivated English and American speech as is sometimes remarked. The opportunity was favorable: I was with them about two days; and, on Sunday, was honored with an invitation to attend, in their company, a religious service at York Minster.

During the ensuing evening, while a few of us were gathered in a small parlor, the conversation turned upon Alexandria, in Egypt, as an attractive winter resort. One of the gentlemen, speaking of the many English and Americans who gather there, remarked that two or three schools had been established in the city lately for teaching the English language. Another, catching at his remark, asked in a slightly ironic tone, " Do they teach English or American? "

The question was hardly presumptuous, as will appear, for the following reasons.

First, we must admit that there is a considerable list of words whose meanings in America differ somewhat from those in England. Without attempting to enumerate them, I will mention a few which are used here in peculiar senses, and will give their equivalents in these senses on the other side of the Atlantic.

Appreciate, for enhance in value. English writers seldom or never use appreciate as the opposite of depreciate.

Admire, for be delighted, — as I should admire to hear him.

Banter, for challenge, — as he bantered him to engage in a race.

Bound, for obliged, — as he was bound to do it.

Deed, for convey, — as he deeded him the property.

Mail, for post.

Raise, for procure, — as I purpose to raise money.

Sick, for any kind of bodily illness. Englishmen rarely use the word, sick, in a physical sense, except with reference to nausea or sickness of the stomach.

Biscuits, for cakes of soft bread as well as of hard, — the word, in England, meaning only hard bread, or what we call crackers.

Bureau, for chest of drawers.

Connections, for relatives by marriage, — the term relations, in England, being applied indiscriminately to all with whom they are allied either by blood or by marriage.

Gentleman and lady, as applied to persons of inferior social rank.

Help, for servant.

Limb, for leg.

Dress, for gown.

Lumber, for cut or sawn timber.

Notion, for inclination, — as I have a notion to do it.

Pitcher, for jug. An Englishman, at the table, would say, Pass me the milk jug.

Temper, for passion, — as he showed temper. In England, this would signify control of passion rather than indulgence in anger.

Timber, for forest, — a usage more common in the southern and western portions of the United States than in New England.

I might add many other words, the American usage of which is criticised abroad. The list would be much larger, if it included words which in our own country have acquired peculiar figurative meanings, and which, in many instances, partake of the nature of slang: for example, ventilate, for expose or express freely, — as, their rascally scheme, when discovered, was ventilated in the newspapers, — Alderman Jones ventilated his ideas on the subject.

But, besides the differences in meaning, it must be admitted that there are also considerable differences in pronunciation and modes of intonation. To our ears, an Englishman speaks with a slight foreign accent. In many cases, it is nearly intermediate be-

tween that of the educated Irish and the American. His voice is strongly modulated — often taking the rising inflection at the end of a sentence; while that of the American tends to a monotone. A sojourner abroad, on returning to this country, is impressed with the prevailing monotony of American speech.

Some of the vowel sounds in certain words are dwelt upon a little longer, or have greater quantity relatively, in England than in America; and this occurs without reference to emphasis or elocutionary effect. I was struck with this fact in the conversations of members of the Archæological Society. In the discourse which I heard from the Canon of York Minster, he said mōst instead of mōst — the *o* sound being considerably prolonged. In like manner, he said prăyer instead of prăyer, — hēēre, instead of hēre. I noticed similar peculiarities in an address by Archdeacon (now Dean) Farrar, at Westminster Abbey, and in a sermon by the Canon of St. Paul's.

In England, oftener than in America, the letter *a* approximates in sound to *a* in father, or is intermediate between this sound and that of *a* in man. An Englishman says brȧnch * not brănch nor brahnch; glȧss, not glăss nor glahs; rȧft, not răft nor rahft. The greater prevalence of the short sound of *a*, in our own country, probably was brought about between

* The vowel *ȧ* (having a dot over it) indicates the intermediate sound between short a and a in father, — as marked by Ayres — and as denoted by Worcester with a short horizontal line surmounted by a vertical line.

two and three generations ago, by the imperfect notation of *a* sounds in Walker's Dictionary — which marked the intermediate sound, in all cases, the same as the short sound. American lexicographers have long protested against this fault, but it is still common here.

Mere and merely are very commonly pronounced in England mĕre and mĕrely, the *e* having a short sound the same as in merry. This is noticeable in the speech of many educated men.

Been is seldom pronounced as here, with the short sound of *i* as in pin; nor is it pronounced with the full long sound of *e*, the same as in bean and as it is given by some Americans who, having returned from a brief sojourn abroad, make a pedantic attempt at English pronunciation. The Englishman begins his utterance of the double vowel in been, with the sound of long *e* and glides into that of short *i* as in pin — thus, be′ĭn. It is not easy for us to copy this peculiarity; since it is a combination of vowel sounds such as, I believe, does not occur at all in American speech. The same peculiarity is sometimes heard in his pronunciation of in, pin and other words in which the combination, *i*, *n*, occurs — thus e′ĭn, pe′ĭn. It is an approximation to the *e* sound of *i* as heard in Irish speech and in various languages of continental Europe, although falling a little short of it. It is true that many English dictionaries mark the vowel sound in been as *e* long, while others mark it as *i* short: but neither are quite correct according to English usage;

since it is a compromise between the two. Their failure to indicate the intermediate or composite sound probably is due, in some instances, to their imperfect systems of marking for pronunciation — which are much inferior to various systems lately devised in America, — while, in other instances, it may be due to the want of careful discrimination. The pronunciation bĕn appears to have been warranted as long ago as when Spenser wrote his "Faerie Queene," for the word was then frequently spelled ben. It has persisted to no little extent, among the uneducated, down to the present day. But there is no justification for it.

I have referred to a tendency in England to prefix to the sound of short *i*, in some cases, a slight sound of *e* — thus, pe′ĭn for pin. In America there is a growing disposition — which is inexcusable — to give to *i* in many instances, the full sound of long *e;* for example, alpeen for alpi̇ne * or alpīne, rapeen for rapi̇ne, teeny for tīny or tĭny, chloreen for chlorĭne, bromeed for bromĭde, and even pantomeem for pantomīme. This fault is most noticeable among young persons who have lately taken up the study of French. It should be carefully avoided.

There are several words in our language, in which, it appears to me, the sound of long *o* is slightly shortened or made intermediate between that and the sound of *o* in done; for instance, whole, both, quoth, and more. All of these, except quoth, have been

* The dot (.), used beneath the middle vowel, indicates the obscure sound — as marked in Worcester's dictionaries.

marked uniformly, by the dictionary makers, with the long sound; and by a considerable majority of them, quoth has been so marked. Buchanan, perhaps, was the first to observe that *o* in quoth had not the full long sound; and, therefore, marked it as having the short sound — the same as in moth. But, in this, he was obviously wrong. Walker dissented, yet remarked: "This latter pronunciation is certainly more agreeable to the general sound of *o* before *th*, as in broth, cloth, etc.; but my ear fails me" (he continues) "if I have not always heard it pronounced like the *o* in doth, as if written *kwŭth*, which is the pronunciation Mr. Elphinstone gives it, and, in my opinion, is the true one." Among the later authorities, Worcester gives *kwŭth* and *kwōth*, preferring the former. The difficulty, in deciding between the two, really lies in the fact that, until recently, orthoëpists have not noticed the few instances of a well-defined intermediate sound between long and short *o;* and accordingly, in their keys to pronunciation, have not provided for it. This intermediate is perceived only by careful comparison. Some years ago, before I was aware of the difference of opinion respecting *quoth*, I remember having a little discussion with a well-known college president about the sound of *o* in whole. He dissented from my opinion that it had not the full long sound. After several futile attempts to convince him of the slightly shortened sound, I mentioned an inscription on a placard hanging in the window of a clothes-cleaning shop, "Spots taken out without

cleaning the whole." When I asked the learned gentleman if he would read it, "Spots taken out without cleaning the hole," he laughed heartily and admitted his mistake.

It may be proper to add, at this point, that Webster's key to pronunciation, in 1840, gave only four sounds for the vowel *o;* while Worcester's, in 1846, gave six sounds, and Sargent's Pronouncing Spelling Book in 1864 gave nine sounds. Sargent notices the shortened sound I have mentioned, — but only when it occurs before *r*, which he thinks modifies it — as, for example, in *more.* I do not know to what extent it has been observed by others. So far as I have noticed, long *o*, when it comes before *th*, is slightly shortened, or has the intermediate sound; as in both, loth, sloth, and quoth. Its shortened sound in loth will be readily perceived on comparing it with the sound of *o* in loathe.

In respect to the sound of long *u*, as it occurs in the final syllable, *ure*, when the latter has a secondary accent, I have noticed no difference between cultivated English and American speech. The words, literature, forfeiture, coverture, aperture, overture, and portraiture, so far as I have observed, are pronounced about the same as in this country. With many speakers, there is a tendency to connect the preceding *t* with the *ure*, and to pronounce the final syllable *chure.* But, in both countries, among those who are most careful, I believe that such syllabication is avoided, and that the pronunciation is lit′-er-āt-urè,

for′-feit-urè, cov′-ert-urè, etc.; although the effect, in gliding speech, is very nearly the same as if the *t* were included with the last syllable.

About the beginning of the present century, Walker, in attempting to correct the common fault of pronouncing long *u* like *oo* — as in literature (lit′-er-a-toor) and furniture (fur′-ni-toor) — not only sanctioned the pronunciation t'ure (which he spelled *t, s, h, u, r, e*) for the final syllable in words where it has a secondary accent, but also in words like nature (nat′-yur), fracture (fract′-yur), picture (pict′-yur), etc., in which it is unaccented. In America, both Webster and Worcester protested against the change in respect to the unaccented final syllable — preferring nat′-yur to nat′-ure and fract′-yur to fract′-ure. But apparently they carried their rejection of the pronunciation, t'ure (which closely approximates to chure) into many words where the final syllable — as in literature — has a secondary accent. Both, however, spelled out the pronunciation of the last syllable in literature, furniture, overture, aperture and other similar words, *t, u, r, e*, giving the long sound to the *u*. The rejection, in such words, of Walker's marking (which nearly indicates the sound of *u* as if spelled *y, u*), for a time, misled many Americans into pronouncing the final syllable *toor*, thus causing a return to the fault which Sheridan, first, and Walker, afterwards, undertook to correct. Yet some who were more careful pronounced the *t, u, r, e* with the *u* sound the same as in pure, the *y* element at the be-

ginning of the *u* being slightly obscured. The pronunciation, *toor*, was most common among the disciples of Worcester; since Worcester used the marking *ture* with the long sign over *u* for many more words than Webster did. I believe, however, that both Webster and Worcester meant that the *t*, *u*, *r*, *e* should be pronounced as if the *u* were spelled *y*, *u*, with the *y* slightly obscured, as in *pure*, and as if *t* were the final letter of the syllable preceding the last, and were partly blended with the *u*, in gliding speech. In fact, *ture* can hardly be pronounced in any other way so as to give the sound of *u* as if spelled *y*, *u* — even with the *y* somewhat obscured, — since a considerable change in the position of the vocal organs must be made in passing from the *t* to the *y*, *u* sound. That it requires a greater change than is needful in passing from *t* to the long sound of either of the other vowels is apparent on pronouncing tame, team, tile and tone, after pronouncing tūre with a distinct *y*, *u* sound. If it was not the intention of Webster and Worcester to give this sound, they certainly were in error as respects cultivated English speech so far as I have observed it.

Englishmen speak most of the consonants more distinctly than we do. Mr. Lowell remarks upon the rifle-crack of the Englishman's yes and no. Certainly it is in striking contrast with the American's ĭ'yĕ and n'nŭr. A cultured English woman in a railway coach with me, comparing the road over which we were traveling, with the Midland road, said, " I like

the Mi*d'l*and much be*t't*er" — distinctly sounding both *t's* in the last word. Many of her countrymen, in comparing two things, would say, " This is be*t't*er than *th*at "; while most Americans would say, " This 's bet'er 'n that," dropping the *i* sound from is, the second *t* from better, and the *t*, *h*, *a* from than. Such imperfect enunciation certainly is more common among the educated classes here than in Great Britain. It may be the result partly of an indolent habit, engendered when our country was so sparsely populated that few persons were privileged daily to hear the conversation of educated men, and when therefore there was a peculiar liability to degeneracy of speech. Yet a careful examination of English literature, from the time of Chaucer to a much later period, shows that such a habit doubtless was inherited, in a measure, from our English ancestry.

I am inclined to think that the consonants which are most frequently disregarded or are least distinctly uttered are those formed in good part with the aid of the palate and of the teeth. In America, the prevalence of catarrhal disease — deadening the action of the palate — and the premature loss of teeth, for many generations past, may have had much to do with this neglect. Until the early part of the nineteenth century, missing teeth, it will be remembered, were seldom replaced with artificial ones.

The most noticeable of the consonant sounds, as spoken in England, is the letter *r*. It is scarcely ever

trilled as in Irish speech or in French; but is strongly enunciated, and sometimes slightly rolled. An Englishman does not pronounce *n*, *o*, *r* like the word, gnaw, but always no*r*, dwelling upon the *r*.

Richard Ayres, in his pronouncing hand-book, entitled "The Orthoëpist," says: "When *r* is preceded by a short vowel, it sometimes has the effect of blending the syllables. Thus the dissyllables, higher, lower, mower, rower, sower, and flower, are pronounced precisely like the monosyllables, hire, lore, more, roar, soar and flour." I do not think this is quite true in American speech; although, in most cases, the difference might not be strongly marked; but, in English speech, the forcible sound of the final *r* in the monosyllables probably would render it impossible, in nearly all cases, to distinguish between them and the nearly corresponding dissyllables; as, for example, in the monosyllable, roar, and the dissyllable, rower, as they occur in the phrases "the roar of the ocean" and "the rower of the boat." The strong sound of the final *r* in the monosyllables is necessarily introduced by the sound of *e* as in her, which gives to the *r* the effect of an additional syllable. Hence, in such words, the feebler sound of *r*, as in American speech, is preferable.

The remedy for imperfect articulation, especially of the consonants, must be found in our schools. I would suggest, as a means of correction, the more frequent and thorough drill of reading classes in such old-fashioned exercises as those beginning as follows:

" Peter Piper picked a peck of pickled peppers ";
" Theophilus Thistle, the celebrated thistle-sifter ";
" Peter Prickle Prangle, the prickly prangly pear-picker ";
" Round the rough rock, the ragged rascal ran "; and so on.

We have many mispronunciations in New England, not discreditably acquired; since they were directly transmitted to us, through seven or eight generations, from our ancestors in the mother country. A good share of them were provincialisms originating in Middlesex, Essex, Norfolk, Suffolk, Chester, etc. — counties in England from which our forefathers came out, and the names of which they gratefully preserved in their new homes, — while others were prevalent in nearly all parts of England. Some of these mispronunciations have died out, and become nearly forgotten, on the other side of the Atlantic; and hence are now regarded by our British cousins as Americanisms. On the other hand, it is doubtless true that some which still prevail in England have disappeared here. Of those that linger in America, and which are of British origin, I may mention the following: — bile for boil, k'yow for cow, dew for do, handkercher for handkerchief, heern for heard, hīst for hoist, jine for join, kĭver for cover, lăther for leather, obleeged for obliged, pint for point, rare for rear, scărt for scared. This list could be largely extended.

In the words, boil, hoist, join, and point, it will be noticed that the diphthong *oi* has been pronounced *i*,

the second vowel being the one sounded; thus, bile for boil. Our Saxon forefathers of continental Europe, like their German descendants of to-day, were in the habit of sounding only the second vowel of most diphthongs; and the conquering hosts from Saxony which settled in England not only continued this practice, but their posterity carried it indiscriminately into the pronunciation of a good share of the Norman French words which they accepted after their subjugation. At a later period, an attempt was made to modify this usage by giving greater prominence in many cases to the first vowel, as in boil (*boyl*) for bile, hoist (*hoyst*) for hīst, etc. But the persistency of the former habit is shown by the fact that, only two generations ago, the antiquated pronunciation was quite common, — that, even now, it prevails to some extent, — and that, in a considerable number of the hymns of the church, still in use, the old sound survives in rhyming couplets—for example,

> "That grand assembly would I join [*jine*],
> Where all thy saints around thee shine."

One day in my boyhood, when I was visiting a grocery, to which I had been sent on an errand, a schoolmate of mine, who had come there for oil, and whom our teacher lately had told he must not pronounce *p, o, i, n, t,* pint, set a small jug on the counter before the storekeeper, and innocently said, "Marm wants a point of ile."

Of the mispronunciation, lăther for leather, it may

be remarked that this is seldom heard now except in the sense of whip — the original significance being to whip with a leathern thong. We occasionally hear the phrase, "I'll lăther the baste," both lăther and baste being good old Saxon pronunciations. They call to mind the following lines of a rollicking Irish ditty in burlesque honor of Bacchus: — *

"Whilst abusing the villain,
Came riding, postilion,
A nate little boy on the back of a baste
Big enough, faith, to ate him,
But he lather'd and bate him,
And the baste to unsate him ne'er struggled the laste."

It will be noticed how in the above misspelled words, the second vowels of the superseded diphthongs have been used to represent the present Irish pronunciations, which are the same as those of the early Anglo-Saxon.

To any who may feel a special interest in learning the origin of Yankee mispronunciations, I would recommend the reading of James Russell Lowell's Introduction to the Second Series of the Biglow Papers. It is both learned and entertaining; and is well worthy of careful perusal by all who desire an acquaintance with the history of our vernacular.

I might mention other differences between English and American pronunciation; but the foregoing will suffice for the present paper.

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* By Samuel Lover, in his well-known novel, "Handy Andy."

In conclusion, it may be remarked that nowhere, probably, do we hear better English pronunciation, on the average, than among the educated classes in New England. This is due partly — beyond question — to the superior intelligence of many of the early New England colonists; but still more, to the careful teaching of pronunciation in our common schools. Yet it is by no means free from faults.

Generally, American speech would be greatly improved if the consonants were more carefully enunciated, and if more attention were paid to suitable modulation. Especially would public speakers render themselves more agreeable, if they avoided the high-keyed monotone into which so many glide during the utterance of their most fervent periods. A natural tone of voice should be assiduously cultivated.

Speech is the gift of men and of angels. Let us be careful, therefore, not to abuse it, either in the choice of words, in pronunciation, or in the mode of utterance.

VI

STORMS: THEIR ORIGIN AND LAWS OF MOTION

If any of us were asked, as students of Nature, to define the abode of man, we should be likely to answer: It is nearly everywhere on the land surface of the earth; being unmindful of the fact that, like the birds of the air and the fish of the sea, we have our range chiefly in a *fluid* element.

We live at the bottom of an aërial ocean. Over our heads, to a depth probably of more than five hundred miles, it rolls its tempestuous billows. It presses upon our bodies with a weight of fifteen pounds to a square inch, or about twenty tons to each person. It grows lighter and less dense, as we ascend, expanding into such tenuity that the most delicate tests fail to mark the limit which separates it from the nothingness of space. It has its tides, its currents, its waves, its eddies and its whirlpools. Its touch, when gently stirred, is as light as that of a fairy's wand; but, when strongly moved, more forcible than that of the wildest breakers on a sea-beaten shore.

Were the aërial ocean, everywhere and at all times, of the same temperature, it would be nearly at rest. But the sun pierces it with his flaming shafts, disturbing its well-balanced tranquillity and sending troublous currents hither and thither to restore the equilibrium.

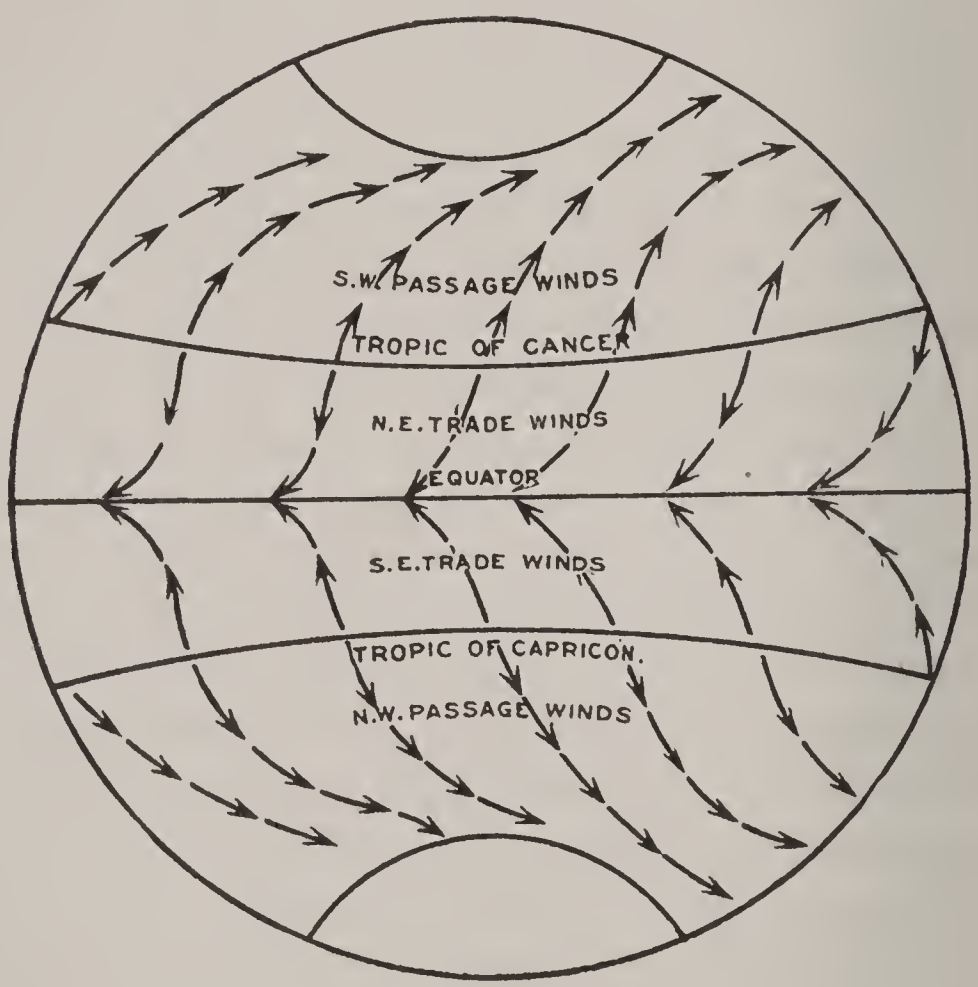
Seemingly " the wind bloweth whither it listeth "; yet it is guided by a providential hand. The tempests are marshaled in battalions, and move in orderly circuits. There is a *law* of storms. To this law our attention is invited. Let us consider it chiefly as it is operative in the north temperate zone, since but little more is possible in the brief interval at our command.

Observation shows that there is a general circulation of the atmosphere, consisting in the flow of cold air toward the warmer regions of the globe and warm air toward the colder regions — just as in a heated dwelling, through open doors, there is a flow of cold air into the warm rooms and of warm air into the cold. If the earth were a mere cylinder, of immeasurable length, and everywhere of equal diameter, and it were girdled by a single heated belt, the circulation of the atmosphere would consist simply in an influx of cold air along the surface, on each side of the heated belt, and an outflow of warm air overhead. But, since the earth is globular and unequally warmed in various parts within the same latitudes, the atmospheric circulation is remarkably complex. From the tropics to the equator — whence the flow is but little affected by the rotundity of the earth's surface (the circumference at the equator being only one-eleventh greater than the circumference at the tropics) — the circulation is comparatively regular. Here are the regions of the trade winds, which are nearly constant, varying their range only as the sun moves north and south, carrying with it the belt of greatest heat.

It will be remembered, however, that the trade winds do not blow directly from the north and south, toward the belt of greatest heat, but have a westward tendency; so that on the north side of this belt they come from the northeast, and on the south side from the southeast. I take the liberty to explain the cause of this westward tendency, although the explanation of it may be familiar to many of you; since I must refer frequently to the same cause operating beyond the trade-wind regions, and affecting the more complex and variable winds of the temperate zones.

As the earth performs its daily revolutions, the parts of its surface which are nearest to its axis, or close to the poles, move slowest; and the parts farthest from its axis, or at the equator, move fastest, — just as the parts of a revolving wheel, nearest the axle, move slowest, and the parts farthest from the axle move fastest (the surface at the hub always moving slower than the surface at the tire). Accordingly, from the poles of the earth to the equator, each succeeding point moves faster than the preceding. Hence currents of air, setting out toward the equator, and partaking of the slow motion of the earth's surface (from west to east) at the place whence they started, successively reach places having a swifter motion eastward than their own. And, since they cannot at once gain the swifter rate of motion, they fall behind to the westward. Accordingly the trade winds originating near the Tropic of Cancer, and moving toward the equator, take, as they fall behind to the westward, a

southwesterly course; while those originating near the Tropic of Capricorn, and moving toward the equator, take, as they in like manner fall behind, a northwesterly course.



In the same way, other winds, originating beyond the tropics, either in the temperate or polar regions, and moving toward the equator, unless turned aside by other causes, pursue a similar course. The law of motion which determines their direction is the same as that which governs the direction of musket shot, when a sportsman shoots sidewise from a wagon mov-

ing in a certain course, directly at a bird flying faster than the wagon goes in the same course, and the shot fall behind the bird.

So, on the other hand, winds blowing from the torrid or temperate regions toward the nearest polar region, and partaking of the motion (from west to east) of the places from which they set out, have a greater velocity eastward than the places they successively reach; and hence, if undisturbed in their course, constantly depart from a north and south line toward the east, or are deflected from their western side, thus becoming in the northern hemisphere southwest winds, and in the southern hemisphere northwest winds. These winds prevail to a considerable extent under the name of *passage winds*, in the temperate zones, especially in the warmer parts and during the warm months. As they advance toward the colder latitudes, they incline more and more toward the east, gaining at an increasing rate on the motion of the earth's surface from west to east upon its axis, which motion lessens in an increasing ratio as we approach the poles. This lessening in an increasing ratio, of the motion of the surface from west to east, as we go from the equator toward the poles, is apparent, if we observe that the circumference of the earth on the parallel of 30° is about 18,700 geographical miles, on that of 40° about 16,600, and on that of 50° about 13,900, making the decrease in circumference between the parallels of 30° and 40° not far from eleven per cent, while between those of 40° and 50° it is about sixteen per cent,

or twice as great, in less than half the distance, as the ratio of decrease between the equator and the tropics. If the northern or southern hemisphere were a mere cone, having its apex at the pole where it terminates, the decrease from the equator to the pole would be in the same ratio throughout; but as it presents a hemispherical surface, the falling off is more and more rapid, or is in an increasing ratio, as we approach the pole. I call atttention particularly to this fact, in respect to its influence in deflecting the winds and limiting the extent of their range, since I regard it as the chief cause of the remarkable diversity of the winds originating at different points in the temperate regions as contrasted with the comparative uniformity of those in the torrid.

The passage winds seldom move far along the earth's surface without interruption; because, of necessity, they progress on converging lines approaching each other more and more rapidly as the breadth of the earth's surface narrows in approaching the poles. Hence the currents of air, being thus crowded together and rendered more dense, through lateral compression against each other — and, therefore, in some measure, heaped up — contribute by their greater weight to the earlier restoral of the equilibrium, the want of which was the primary cause of the atmospheric disturbance. The tendency thus to heap up, owing to convergence with approach toward the polar region, is similar to that in the case of an ocean tide compressed between jutting headlands into a

long tapering inlet — like the tides in the Bay of Fundy, which rise more than sixty feet.

The contrary of these facts is true in respect to the return currents, especially those in the upper atmosphere, blowing from the colder regions toward the tropics. They are deflected in the same manner as the trade winds, but with a more abrupt curvature, and expand laterally as they advance, soon approaching an equilibrium with the lighter atmosphere of the region toward which they move.

The limited sweep and inconstancy of the winds in the cool temperate regions, as compared with the broad range and the continual prevalence of the trade-winds, while partly due to the cause just mentioned — namely, the rapid convergence as we depart from the tropics toward the poles, — are also due partly to the greater changes of temperature with slight changes of latitude, and to the stronger contrasts of the seasons in the temperate zones in passing from summer to winter and from winter to summer. In the northern half of the *torrid* zone, the mean temperature of July in the hottest districts at the level of the sea is about 90° above zero; and of January in the coldest districts, about 70° above, the difference between the hottest and coldest thus being only about 20°; but in the *north temperate* zone the mean temperatures, similarly contrasted, are approximately 90° above and 40° below, the difference being the sum of these figures, that is, 130°, or between six and seven times as great as in the torrid zone. For a considerable

period, therefore, during summer, even the colder parts of the temperate zones have an almost tropical heat; yet, for a long period in winter, they are icy cold. Thus, in Montreal, the summer heat is sometimes almost as oppressive as in New Orleans, although in the former the winter's cold is occasionally severe enough to freeze mercury, while in the latter it is seldom such as to prevent roses blooming in the open air.

These strong contrasts have a marked effect upon the atmospheric circulation, causing that of the warmer months in the temperate zones to be materially different from that of the colder, and producing a variableness of winds in regions remote from the equator which is unknown in the torrid regions. The temperate regions, therefore, are often marked, on meteorological maps, as Regions of Variable Winds, while the torrid are marked as Regions of Constant Winds.

I shall now describe in general terms the winds of the temperate zones. The most prevalent are those which blow more or less directly from the west — coming often, in the warmer latitudes of the north temperate zone, from considerably south of west, and in those of the south temperate zone, from considerably north of west. The latter currents are generated partly in the neighborhood of the trade-wind regions. On the outer borders of these regions, it was observed long ago that there are comparatively calm belts, within which sailing vessels, in many instances, are

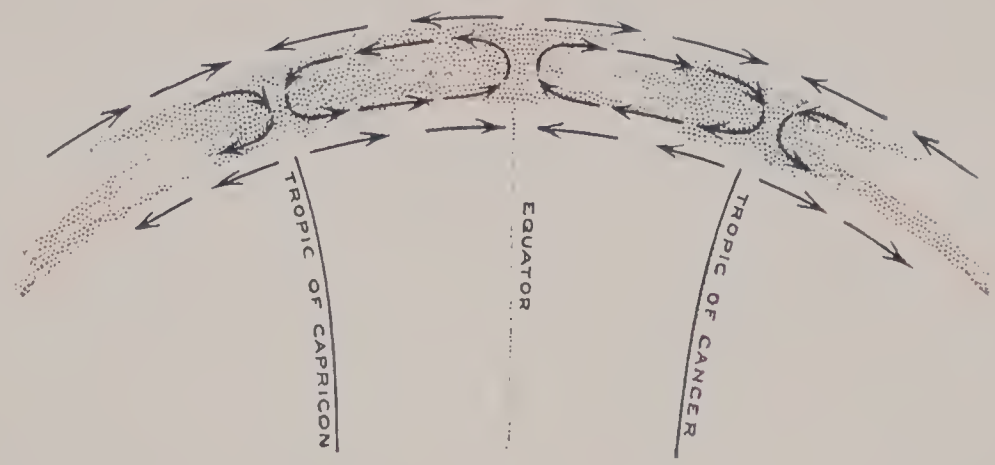


Diagram showing the meeting of currents of air in the calm belts at the tropics, whence the Trade Winds and Passage Winds flow forth.

detained for weeks together. Near the West Indies, the northern calm belt early became known as the Horse Latitude; since ships formerly voyaging thither from New England with deck loads of horses were sometimes becalmed within its limits until obliged by want of fresh water for their animals, to throw many of them into the sea. The existence of these calm belts in the neighborhood of the tropics is believed to be due to the meeting of upper currents of air from the temperate regions with upper currents from the warmer parts of the trade-wind regions, — the opposing currents neutralizing each other, as they conflict, and causing a comparative calm, within which the air, being rendered more dense by compression, settles down, and from one side of which the trade winds blow, and from the opposite side, the passage winds. [See diagram, opposite.] Within the calm belts, the air is heavier, as shown by the barometric pressure, than on either side of these belts; and consequently the winds just mentioned are pressed out from beneath them, the former toward the equator, and the latter toward the cooler latitudes.

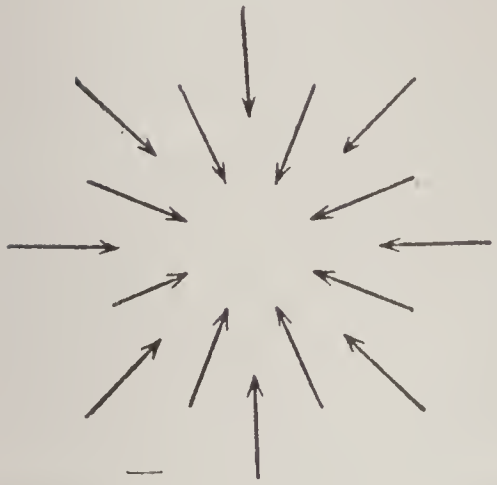
It will be borne in mind that all surface winds blow from a region of comparatively heavy atmosphere toward a region of lighter atmosphere, the heavy air over-balancing the adjacent lighter air, and therefore sinking and forcing its way beneath it, thus lifting up the lighter air and causing it to flow off overhead. The action is the same as would occur in a trough divided into two compartments, one filled with oil

and the other with water, if the separating partition were suddenly removed. The water would overbalance the oil, and gradually sinking would force its way underneath, and the oil, thus lifted up, would rise and spread out over the surface.

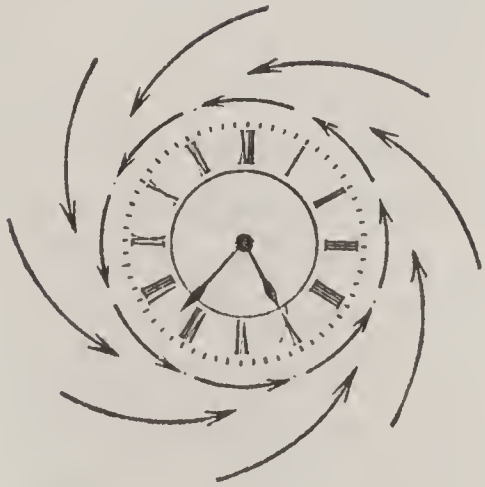
The primary cause which disturbs the equilibrium of the atmosphere is, as already indicated, the unequal heating and cooling of different parts of the aërial ocean. I have already called attention to the influence of unequal heating and cooling in different latitudes and at different seasons, especially to the influence of the striking contrasts of heat and cold in regions remote from the equator. But besides this influence due to difference in latitude, there are also important influences due to local causes; such, for instance, as the presence of land in one part and water in another (the land surface being more readily warmed and cooled by exposure to the sun than the water surface), — or the presence of cold mountain chains or extensive forest tracts in one region and of treeless plains or sandy deserts of but slight elevation, in another, — or the condensation of vapors in occasional showers, which always causes local warmth. These differences give rise here and there to centers of warmth; in the neighborhood of which the air becomes rarified, often over extensive tracts, causing the inflowing of the cooler and heavier air from all sides.

During the early part of the nineteenth century, the attention of the American meteorologist, Professor

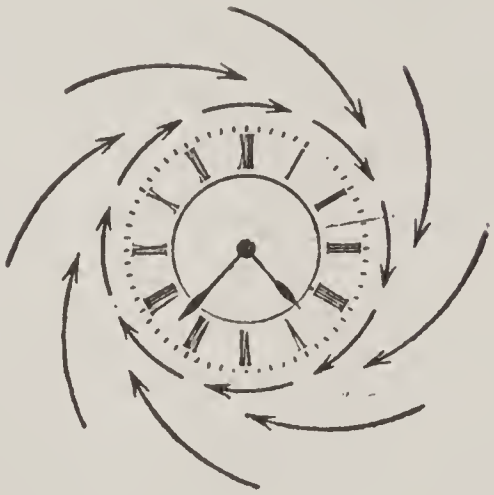
COURSE OF THE WINDS



In many places throughout the world, as conjectured by Espy.



Here and there in northern hemisphere, as learned by Dové.



Course of cyclonic whirls in southern hemisphere, as discovered by Redfield.

Espy, was especially drawn to this fact; and he was led to regard the inflowing air as moving in direct radial lines toward the center of the heated districts. At a later period, Professor Dové of Berlin discovered, by a comparison of simultaneous observations at various points on land, that the inflowing is not in radial lines, but in somewhat incurving lines gradually approaching the heated center. Afterwards Mr. Redfield of New York announced to the world his remarkable discovery that the inflowing of the air toward heated centers — which results often in revolving storms or cyclones — is not only in incurving lines, producing a whirl, but that in the northern hemisphere the whirl is *always* in a direction contrary to that of the hands of a watch laid on its back, and in the southern hemisphere is always with the hands of a watch. This discovery was made by comparing the entries of simultaneous observations, in a great number of sailors' log-books, of the course of the winds on different parts of the ocean. It showed the existence of a law, the call for an explanation of which presented for a long time an unsolved problem. My own attention was first drawn to this problem about the year 1856, while I was engaged, as a professional geographer, in studying the laws of climate, it being some time before the publication of my solutions, after persevering study, of the two perplexing problems: why the northern hemisphere, as a whole, is warmer than the southern; and why more rain falls in the northern hemisphere than in the southern. As

the result of occasional pondering upon the subject during a term of years, the explanation of Redfield's law at last dawned upon me. I stated it to a few scientific friends; and subsequently was invited to present my theory in a lecture before an educational body at Newark, New Jersey. But, being doubtful whether I was really the first to arrive at a satisfactory explanation of Redfield's law, I declined the invitation. Later I learned that Prof. William Ferrel, a teacher in Nashville, Tennessee, afterwards connected with the United States Coast and Geodetic Survey, had offered a partial explanation (differing somewhat, in its mode, from my own) several years before, in an article which, it is hardly remarkable, had escaped my observation: since it was printed in the Nashville *Journal of Medicine and Surgery*, a publication not likely to fall into the hands of many persons except practicing physicians; and since I was not engaged at that time in scientific pursuits. I shall refrain from presenting my explanation until I have occasion to speak more at length of cyclones.

The whirls or eddies in the atmosphere, caused by heated centers, are very common in the temperate zones; and interfere materially with the general drift between the tropical and polar regions. All are of a cyclonic character; but differ in development, according to the relative warmth and extent of the heated districts. Their locations vary with the changes in local conditions resulting from the fall

of rain or snow, from the cooling influence of overshadowing clouds, and from a variety of other causes.

The heated centers have their counterparts or offsets in cool centers, from which there is an outflow along the surface of the earth, in lines curving outwardly, just as with respect to the former there is an inflow in lines curving inwardly.

Accordingly a great part of the air in the temperate regions is moving in whirls, developed around warm or cool centers, and forming revolving columns or whirling disks, with their axes sometimes vertical but often slightly inclined, and their bases commonly resting upon the surface of the earth. They vary in diameter from less than a mile to more than a thousand miles, a single whirl, as represented on some of our weather maps, occasionally overspreading a large part of the United States, east of the Rocky Mountains. The location of their centers, or of the axes of the whirls, sometimes remains nearly stationary; but usually moves onward in a curvilinear path, until the rotating current has ceased.

The whirls around the *heated* centers are called cyclones, a name not necessarily indicating, as in popular American usage, the violent whirls more specifically termed hurricanes or tornadoes, but referring to the approximately cycloidal course traced by the rotating current upon the earth's surface.

The whirls around the *cold* centers are called anticyclones.

Secondary whirls are occasionally developed within the currents of the larger whirls, but at a considerable distance from the centers of the latter, just as secondary eddies or small whirlpools are often developed within the currents of a larger eddy in the border of a river, where it sweeps around a curve. In some instances, they are of little breadth, but are remarkable for their violence or intensity. *It is the small secondary whirls*, developed in the currents of larger cyclones and revolving with tremendous velocity, which constitute the destructive tornadoes prevalent in certain parts of our own country, especially in the Mississippi Valley.

The tendency to a whirling movement, in the rapid inflowing of currents of air resulting from intense heat, was long ago observed in the burning of cane-brakes in the South, and occasionally in the conflagration of the dry rank herbage of Western prairies. The flames of the cane-brakes often rise in a whirling cone; and occasionally, as they spread out above, form an inverted truncated cone, the small end of which rests upon that of the lower truncated cone, the whole column taking a shape similar to that of an old-fashioned dice box.

The small whirls in the atmosphere, resulting from terrestial heat, always revolve like the larger ones, in the northern hemisphere, in a direction contrary to that of the hands of a watch laid on its back, and in the southern, with the hands. In a record of more than six hundred tornadoes in the United States, not

one was found to have revolved otherwise than against the hands of a watch.

It is further observed that all cyclones or tornadoes contain in the middle a comparatively calm region, or vortex of nearly still air, corresponding to the vortex of a whirlpool; and that they travel (or, in other words, their axis of motion advances) in a somewhat parabolic path, while their whirling currents describe an approximately cycloidal path. They may be compared to a hollow column, revolving upon a nearly vertical axis and at the same time moving forward along the earth's surface.

Cyclones are usually attended with rain, at least for a time, or at intervals, while passing over any given point.

The tendency to rain, accompanying the inflowing of air toward heated centers — except in deserts — was noticed many years ago. Humboldt remarked that volcanic eruptions in the torrid zone, causing intense local heat and giving rise to a strong inflow of cooler air from all sides, are attended with heavy rains even during the dry seasons. Professor Espy observed that, in the burning over of considerable tracts of dry ground in the South during summer droughts, clouds were seen to gather and refreshing showers fall, although under ordinary circumstances, no interruption of the drought could have been anticipated. He, therefore, contended that the artificial production of rain was possible. Soon after the promulgation of his theory, many statements were pub-

lished, which corroborated his views. Among these was a letter from an engineer engaged in Government surveys in Florida. The engineer remarked that, having occasion to burn over an extensive tract of dry rank herbage covering the bed of a saw-grass pond from which the water had been exhausted by the summer drought, one of his assistants, who had read Professor Espy's theory, called attention to the fact that it would be likely to cause rain, and proposed to practice upon the credulity of the superstitious negroes of their party by making them believe that he could cause clouds to gather and pour down a shower. Permission for his ruse being granted, he requested the men who were reclining on the ground, exhausted by the parching heat, unrelieved by a breath of air, to cut through the heavy herbage, and promised, if they would do so, he would give them a plentiful rain and a breeze too, that would wake them up. His words were received with derisive laughter, whereupon he affected to be very indignant. To hasten his victory, the grass was ordered to be set on fire. The narrative proceeds substantially as follows:—

The flames ascended forthwith above the tallest tree; a dense volume of smoke mounted upwards spirally; the grass soon disappeared. As the smoky column broke, and a cloud began to form, the captain traced a large circle in the sand, and placed himself in its center, making fantastic figures, and forming cabalistic phrases out of broken French. All eyes

were riveted upon him as at length he began tracing outlines of devils. At this juncture, came a roll of distant thunder; every glance was instantly turned upward, and the cloud was seen spreading. The lightning flashed vividly, and the thunder increased. The knees of the negroes smote together with alarm. Already was the rain descending, and in torrents; though the clear sky could be seen in all quarters of the heavens except directly overhead. The captain maintained his mystical attitude; while some of the whites who were in the secret fell upon their knees, and were imitated by the negroes, whose fears augmenting as the storm grew fiercer, clasped their hands, and fastened upon him a stare of awe and deprecation. In short, the scene presented a more complete triumph of philosophy over ignorance than one would have supposed possible in the nineteenth century and in our own country. The writer states that the saw-grass was often fired afterwards, and that whenever there was no wind stirring, there was an unfailing certainty of rain, although not a single shower was known there at any other time for many weeks.

Respecting the cause of the whirling movement of cyclones in the northern hemisphere, in a direction contrary to that of the hands of a watch lying on its back, I now call your attention to the fact that, in the in-rush of air from all quarters, toward the heated center, the currents from farther south — since they partake of the eastward motion of the earth's surface at the points from which they set out — have (as

already explained) a faster motion eastward than the points at which they arrive, and, therefore, are deflected to the eastward of a north and south line, so that they blow approximately from the southwest. On the contrary, currents from farther north than the heated center — since they partake of the eastward motion of the earth's surface in the localities from which they set out — have (as before explained) a slower motion eastward than the localities at which they arrive, and therefore are deflected to the westward of a north and south line, so that they blow approximately from the northeast. These northeast winds, meeting those before mentioned from the southwest — since the former have a much less rapid motion eastward than do the latter — fall partly behind them to the westward, and in so doing, impinge against the latter somewhat obliquely or sidewise, in such a manner that each turns the other partly around, and thus starts a whirling current which is maintained subsequently by the continuous inflowing of currents from the northeast and from the southwest meeting in like manner. Obviously the turning on the western side of the whirl would be in a southerly direction, while that on the eastern side would be in a northerly direction, — thus causing the revolution in a direction contrary to that of the hands of a watch laid on its back.

To illustrate: Let us suppose a rod to be supported horizontally by the hands, one above the other, with the fingers pressing against it as shown in Figure 1.

While thus held, it would be unmoved, or each end of the rod would remain at the same height. But if, now, the lower hand were slid a little to the right, and the upper one a little to the left, as shown in Figure 2, and the pressure against the rod were continued as

FIG. 1

FIG. 2

before, the left portion of the rod would be forced downward and the right portion upward, and the rod would begin to swing around, as upon an imaginary pivot, in a direction contrary to that of the hands of a watch. And, as long as the fingers maintained the same relative position in respect to the rod and continued to press against it, it would keep moving or swinging around in the same direction.

So winds meeting and pressing toward or against each other, along a given line — one current of air coming from the southward and veering considerably to the right, the other coming from the northward and veering still more to the left — would, as they conflicted, turn or whirl about just as an immense

weather vane would, if it were placed between them and were long enough to be affected by each side of the whirl.

To illustrate further: The revolving movement of a cyclone is started somewhat in the same way as a partial whirl is produced when two men, walking rapidly in opposite directions, come in collision, each striking his left shoulder against the neighboring shoulder of the other. As we all probably have experienced a partial reverse from such a collision, we are better prepared to understand the origin of a cyclonic whirl, and to realize that, if there were a continuance of the force which turned us partly around, as there is a continuance of the force of steadily blowing winds, we should soon be spinning about at an uncomfortable rate. We may remember, then, that when a cyclone occurs, the whirl originates because two opposite currents of the inflowing winds conflict, while edging away from each other sidewise, and hitting together their adjacent shoulders.

In the southern hemisphere, as the conditions in respect to the meeting currents of air are precisely the reverse of those in the northern, it is plain that the whirls would be in the opposite direction.

The points, just presented, do not appear to be brought out in Professor Ferrel's explanation; although it is not impossible he may have had them in mind.

Understanding now the origin and direction of the whirl of a cyclone, let us consider what produces the

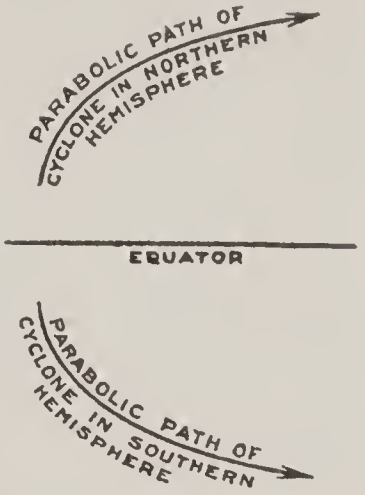
vortex, or comparatively calm region in the center. Of course the inflowing currents, notwithstanding the whirling tendency, move toward the heated center, in gradually incurving lines, with a strong centripetal force. But, as the velocity of the whirl increases, the nearer they approach the center, owing to the shortening of the radius of revolution, the whirl at length acquires such a speed as develops a centrifugal force sufficient to overcome or hold in check the opposing centripetal. In fact, the centrifugal force becomes so great that it causes the revolving air in the vortex of the whirl to move outward until the atmosphere in the middle is so rarified and becomes so little affected by friction with the neighboring air that its whirling motion virtually ceases, and there follows a comparative calm.

It is this deceptive calm, in the midst of cyclones or hurricanes, which so often, in former years, misled navigators, to their ruin. Their vessels having been struck on one side by the advancing whirlwind, and the sails trimmed, and the course shaped, so as to withstand its fury, a lull ensued, during which the frail barque remained idly rocking upon the waves; when suddenly it was struck on the opposite side by the tempest, thrown perhaps on its beam-ends, and left dismasted and dismantled to drift a helpless wreck.

Present knowledge of such storms and of the signs preceding them enables navigators, in many instances, to sail away to one side or the other of their whirling

currents, and thus to escape disaster. They are helped, in such avoidance, by acquaintance with what is known as Ballot's law: to wit, If you stand in any part of the whirl, with your back to the wind, the area of low barometric pressure (which is always found in the vortex of the storm) is at the left hand in the northern hemisphere, and at the right hand in the southern. The reason of this law is apparent on considering the direction of the whirls in the respective hemispheres as before stated. Hence the navigator, having determined on which side is the vortex of the storm (or the eye of the storm, as it is often called) finds it easy, by directing the course of his ship away from the vortex, to sail out of the storm.

Respecting the path of cyclones, or the direction in which the axis of the whirling columns or disks advance, I have already remarked that it is approximately in a parabolic curve. It may be stated further that, in the north temperate zone, the path nearly always has a decided easterly bearing, inclining, in most cases, to the northeast, especially on the ocean, and acquiring a greater easting as it moves on. It is said that no storm has ever been found crossing the North Atlantic from east to west, or moving from our Atlantic coast to the plains beyond the Mississippi River. In some instances, however, a



storm advances toward the southeast. This occasionally happens in our own country, especially during the colder months. Professor Loomis estimated that the average direction of the progress of nearly five hundred storms in the United States, from 1872 to 1874, inclusive, was east by 9° north. It is evident that the direction of their advance was determined by the predominant currents of air flowing into the whirl, since it was nearly coincident with that of the strongest, as they met in the whirl. Hence as the strongest current contributing to a cyclone in the north temperate regions comes almost always from the southerly side of the whirl — blowing toward the northeast — the prevailing direction of the cyclone is to the north of east. Of three hundred and eighty-four tornadoes reported upon by Sergeant Finley, of the United States Signal Corps, three hundred and four moved from southwest to northeast, and twenty-one others approximated more or less to such a course.

The reasons why, in the north temperate regions, the strongest currents, or those which are most influential in determining the pathway of a cyclone, come almost always from the southerly side are as follows:

(1) In the movement of the air from the southerly side, or from the lower latitudes toward the higher — approximately in the same course as the passage winds — there is an increasing tendency to converge or crowd together, because of lateral compression, as

the air advances in the direction of the pole (which is a mere point) and thus to become more dense and to exert a greater force.

(2) The passage winds which are prevalent in the north temperate zone are somewhat helpful to the inflowing currents on the southerly side of a cyclone, since they approximate to them in direction, but are more or less adverse to the currents from the northerly side.

(3) The currents of air from the southerly side of a cyclone in this zone are less hindered by currents inflowing toward it from the east and northeast — which are somewhat retarded by the passage winds — than are the currents from the northerly side by those inflowing from the westerly and southwesterly sides, which latter are more or less helped by the passage winds, and therefore are stronger.

(4) The currents of air from the southward come to a cyclone, in the north temperate zone, more directly than do those from the northward — being less deflected toward the east than the currents from the polar side are toward the west, this difference being due to the fact that the variation in the distance from the axis of the earth of the points on its surface over which the currents from the southward come is considerably less than such variation is in respect to the points over which those from the northward come. Hence, as the flow of the currents from the southward toward the whirl is more in a direction toward the center of the whirl — or approximates

more nearly to a meridional line — than is the flow of those from the northward, they strike it more directly and forcibly, and therefore tend to bear it onward in the course in which they are moving and against the opposition of the more oblique currents from the northward.

Professor Ferrel attributes the progressive motion of cyclones in the north temperate regions chiefly to the passage winds: but enters into no details on the subject; except as it is involved in a discussion of the general circulation of the atmosphere. The latter, he treats in good part mathematically.

The parabolic curvature of the path of a cyclone on this side of the Tropic of Cancer results from the fact that the controlling current which determines its course, and which comes from the southerly side, is deflected more and more from a north and south line as the cyclone advances toward the higher latitudes, the deflection being in an increasing ratio as the part of the earth's surface over which it is passing inclines more and more toward the pole and thus approaches nearer and nearer, in an increasing ratio, to the earth's axis.

The rate of progress of a revolving storm along its pathway in the north temperate zone varies from almost nothing to sixty or seventy miles an hour. The distance from St. Louis to New York, which is not far from 900 miles in a straight line, is commonly traversed in about thirty-six hours. But while the axis of the storm advances at a mean of from twenty-

five to thirty miles an hour, or at about the speed of an ordinary railroad-express train, the velocity of the whirl, especially near the middle of the storm, may greatly exceed this. In a brisk gale, it is about fifty miles an hour; and, in a hurricane, one hundred or more.

The area of the whirl, as it moves along its path in this zone, approximates to an oval shape, being longest generally from southwest to northeast; since the predominating force of the current from the southward, which is the strongest current pouring into the cyclonic pool, and which bears it along, is always sufficient to stretch it out lengthwise. It is narrowest from side to side when it travels fast, that is, when the elongating force, or force that bears it along, is greatest. At the center of the storm, the barometer sometimes sinks an inch.

The place of highest barometer and of greatest force in the revolving current is not far from midway in the northeastern part of the whirl; since it is there that the controlling current from the southward, which determines the pathway of the cyclone, meets most forcibly the more oblique current from the northward, and gains the mastery, the air at that point becoming most dense.

The question naturally presents itself, Why are whirling storms usually attended with rain? It may be answered as follows: They are generally well supplied with vapor by the inflowing currents of air on one side or another. Thus, in the eastern part of the

United States, those which feed the whirl on its southern and eastern sides are, in most cases, charged with vapors from the Gulf of Mexico and the Atlantic. As they enter the whirl, the vapor-bearing currents mount upward spirally, the inrushing air from all sides of the whirling column (the base of which generally rests upon the surface of the earth) being unable to find relief from the compression of the opposing currents, except by ascending. Thus the vapors are condensed not only by compression within the whirl, but by contraction from the cold, as they rise to a greater height, and so produce a rainfall. But their condensation is promoted chiefly, especially in violent storms, by their being pressed together in the parts of the cyclone where the centripetal force of the inrushing currents is nearly counterbalanced by the centrifugal force of the whirl. Beneath the condensed ring resulting from this pressure, the barometer stands much higher than in the vortex, or comparatively calm region within.

It is well understood that, in the condensation of vapor, heat is always evolved. Hence it is apparent that the warmth which causes the continuous in-draft of air in cyclones, and thus maintains them for a considerable period, while they traverse, perhaps, half the breadth of a continent, or nearly cross an ocean, is derived largely from the condensation of the vapors within their own spirally ascending currents. The supply of vapor is obtained, as we have before noticed, chiefly from the inflowing currents

near the earth's surface, which take up moisture from damp ground or from bodies of water over which they pass, and which, being retarded by friction upon the earth's surface, have a less rapid whirling motion, and are less affected by centrifugal force than the currents above, and therefore approaching nearer to the center of the vortex flow upward within the whirl, very much as a current of air flows up a heated chimney flue. Of course, there is little or no condensation within the vortex, and accordingly little or no rain there. The cyclone, therefore, generally forms a nearly horizontal rain-ring, which is borne onward in almost all cases by the greater force of the inflowing air-currents from the southerly side; and thus, as it advances, with the wind blowing briskly, pours down copious showers. But, as the cyclone progresses, and the forward portion of the ring passes a given point, so that this point comes within the calm region in the interior, the rain there ceases, and there is no rain in the vortex of the storm, or in what the officers of the Signal Service Bureau term the "storm center." The calm, however, is succeeded by rising winds in the following half of the whirl, which blow from the opposite quarter. Hence there is a renewal of the rain, followed by a gradual decline of the wind and a corresponding abatement of the rain. The storm is over, only when the rear of the ring has passed.

Beyond the cyclone regions, which are always areas of low barometer, except beneath the rain rings,

we commonly find anticyclone regions, characterized by a clear sky, cooler air, high barometer, and little wind. The anticyclone is precisely the reverse of the cyclone in the direction and character of its currents, which flow in from above, bringing little or no moisture, descend spirally, and pass off below in outwardly curving lines along the earth's surface. Within the limits of these currents, little or no heat is evolved by condensation; and, for this reason, in part, the whirl of the anticyclone is never violent.

Without attempting to discuss the weather characteristics of regions intermediate between cyclones and anticyclones, but merely referring to a few of the facts just explained, we are prepared to understand the significance of such reports from the Signal Service Bureau as the following: "The New England coast, Northern Montana and Northwestern Utah were areas of storm centers last evening. The barometric pressure was high in the Mississippi Valley. It was cloudy throughout New England." *Predictions:* "For Maine and New Hampshire, light rains, followed by fair colder northwesterly wind. For Massachusetts, Rhode Island and Connecticut; colder, fair, preceded by rain on the coast; northwesterly winds."

Before dismissing the subject of rotary storms, it is proper to give some attention to those of a violent character, especially to such as occur in our own country. I have already spoken of the latter as smaller secondary whirls developed in the currents of

larger cyclones and revolving with tremendous velocity. They may be distinguished from ordinary cyclones, as hurricanes. It has been remarked that — within the United States — "where most fully studied, they seem to occur along the contact line of warm southerly winds and cooler northwesterly or westerly winds." In no part of the temperate zones, probably, are they so frequent as in the Mississippi Valley and in our Southern States.

The whirl begins generally at a height in the atmosphere, where the winds are free from obstruction, and gradually extends downward, partly by frictional action upon the air below, and partly by the circling inflow of the lower and cooler strata of air into the warm funnel-like vortex. All the inflowing currents take a gyratory movement. As the hurricane develops, a tunnel-shaped cloud is generally formed, of the most ominous character, its vapors being rolled together in frightful agitation. As the vapor increases, the cloud descends, sometimes presenting a long spout or trunk swaying to and fro in a threatening manner. The roar of the approaching tempest is terrific. Striking the earth, it moves along a pathway varying in breadth from two or three rods to nearly two miles; and is more or less sinuous or zigzag in its course, according to the fitfulness of the inflowing currents of air from the different sides and to its deflections by occasional obstacles. The mean breadth of a large number of such paths is estimated at a fifth of a mile; the average length, at a little

more than twenty-eight miles. There are instances in the United States of a tornado pursuing a destructive path, two hundred and fifty miles long. The rate of progress, as before stated, is about thirty miles an hour. Sergeant Finley estimates the average velocity of the whirl at nearly four hundred miles an hour; and thinks that in some cases the speed attained is not less than eight hundred miles an hour. Others estimate the maximum speed in rare instances at not less than two thousand miles an hour, or approximating to that of an ordinary cannon shot. But this could occur only in cases of extreme shortness in the radius of the whirl. Remembering that a velocity of only ninety miles an hour is sufficient to strip the sails from a ship, we can readily understand the tremendous destructive force of hurricanes.

In the spring of 1880, I was in Indianapolis, when a hurricane swept over the city. It occurred about eleven o'clock in the evening, and, although my lodgings were nearly a mile from its destructive path, I was startled by the roar. The next morning, I visited the scene of wreck. One of the first objects that met my view was a fine mansion-house, from the tower of which a capstone weighing probably a ton had been torn from its cemented bed and dashed down through the roof of the *porte-cochère*. Nearby, I saw an iron fence, rent from its fastenings, and the wrought-iron rails which supported the palings twisted into the shape of a letter S. Passing through a grove of oaks not far distant, it seemed as if Titans

had been struggling in their midst. Many of the trees were torn up by the roots — the spirally ascending current, near the vortex of the whirl, catching them beneath the branches and lifting and twisting them from the earth — whence they were carried along a considerable distance. Others, with trunks about two feet in diameter, were completely twisted off, the splinters at the tops of the stumps plainly showing the direction of the whirl by which they had been broken. Many shattered and unroofed houses were seen, as I walked on; and, at one point, I noticed a strongly framed church edifice which had been moved bodily, about four feet, along its foundations. Among the most striking wrecks, was a brick house, nearly half the corner of which, to a depth of three or four feet, had been blown out, or dashed away by flying timbers. A few rods off, I observed another, the blank end-wall of which had been pierced through and through with flying timbers, being riddled as if by cannon shots. Some of the timbers were still sticking in the wall. But among all I saw, nothing impressed me more, as showing the tremendous power of the wind, than a thin splinter of shingle, weighing hardly a pennyweight, the blunt end of which had penetrated the edge of a wooden fence paling obliquely to a depth of three-eighths of an inch. Had it been shot from a musket, it could hardly have sunk deeper.

Similar instances are recorded of like power in other whirlwinds; as, for example, in the shooting of a corn-stalk partly through a door, and the driving of

nails, head first, firmly into a plank. A tornado that swept over East St. Louis, not many years ago, is reported to have lifted a twenty-ton passenger locomotive from the track, and hurled it into a neighboring ditch. Harnesses have been torn from horses, chickens often stripped of their feathers and swept away like chaff, and men and beasts lifted up and carried a long distance before the wind.

It is remarkable that the tornado I have mentioned, in Indianapolis, was not destructive of a single life, although a few persons were slightly injured. In one that passed over Marshfield, Missouri, about the same date, over two hundred buildings were demolished, sixty-five persons killed, and more than two hundred wounded.

If the question be asked, how can a whirlwind exert such prodigious force? it must be answered: Only by the tremendous velocity of the whirl and the great condensation of the air when driven at such a rate and violently compressed between strong centripetal and centrifugal forces, until it becomes nearly as dense as the gases formed by the explosion of powder in a gun. The velocity results from the extreme shortening of the radius of the whirl, it being a well-known law that when a whirling body is drawn toward the center about which it swings, the rate of rotation, if unimpeded, will increase in the same proportion as the radius of rotation is shortened. To illustrate this point: Take a key, tied to the end of a string about half a yard long, and with one hand swing it around

in a horizontal plane until it acquires a moderate velocity; then, lifting a finger of the other hand, intercept the progress of the string about midway, and instantly the speed of the revolution will be nearly doubled. It is also a law that the centrifugal force will increase in a ratio corresponding to the square of the velocity.

Destructive tornadoes are attended with violent washing rains and hail — occasionally denuding the face of the ground of a great part of its herbage.

They prevail chiefly during the latter part of afternoons in the warm months, and are not uncommon in the middle portions of the Mississippi Valley.

It should not be understood, from what has been said, that rains occur only with rotary storms. They originate often with other movements of the atmosphere which give rise to ascending currents of vapor-laden air. This is especially the case when moist winds pass over mountain regions, their vapors being transformed into clouds, and precipitated on reaching a chilling height.

Would time permit, I should be glad to speak of the divine wisdom which is manifest in the control of storms, notwithstanding their occasional destructiveness, and in the distribution of the rains. Suffice it to say that the student of meteorology is almost inevitably led to look through Nature up to Nature's God, and sometimes to feel a thrill of profound emotion, such as is expressed in Montgomery's lofty hymn of praise: —

" The Lord, our God, is full of might;
The winds obey his will;
He speaks, and in his sovereign height,
The rolling sun stands still.

" His voice sublime is heard afar,
In distant peals it dies;
He yokes the whirlwind to his car,
And sweeps the howling skies."

The Rose-breasted Grosbeak

VII

A GLIMPSE OF THE FEATHERED TRIBES

How gladly in childhood we welcomed the coming of the feathered songsters in spring; with what delight did we listen to the first notes of the robin and the bluebird! What pleasure we found in these charming sylphs of the air during their season of mating and of nest building! How we rejoiced, if a few venturesome birds made their homes in the trees of our dooryard, or beneath the shelter of the neighboring barn! If, perchance, a gold robin hung his lightly swaying nest near by, and we saw the flashing of his bright plumage as he flew to and fro, and heard his melodious notes, how close at hand seemed fairyland!

No branch of natural history, perhaps, is so attractive to us, from youth to age, as that relating to birds —

> " Birds, the free tenants of land, air, and ocean, —
> Their forms all symmetry, their motions grace, —
> In plumage, delicate and beautiful."

Birds constitute one of the four classes which make up that department of the animal kingdom known as vertebrates, or animals having a backbone. According to their rank, these classes are, (1) mammals, or animals which suckle their young; (2) birds, (3) reptiles, (4) fishes.

But, although birds are vertebrates, no portions of

their spinal columns, except the neck, are flexibly jointed, like those of the three other classes.

In general, their bony framework is characterized by its lightness — the bones being hollow to a much greater extent than in quadrupeds — and the flat bones, of a peculiar cellular structure. The lightness is needful, that the body may be easily borne upon the wings.

In those which are much given to flight, Nature provides for lightness by making nearly all the muscles, except such as are used when on the wing, comparatively small. Hence most of their flesh is about the breast and in the immediate neighborhood of the wings. This is very noticeable in pigeons.

Birds are capable of receiving a great quantity of air in breathing. The air is not restricted to the lungs, but passes through, into membranous cells occupying a large part of the chest and abdomen. It penetrates even the tubular openings of the bones and is diffused through their cellular structure.

Rapid motion, such as occurs in flight, retards breathing, or, as we sometimes say, "takes away the breath." It is plain, therefore, that ample space for the storage of air, in the bodies of birds which are much upon the wing, is needful for the proper oxidization of their blood during prolonged flight. The importance of this is manifest when we consider their speed and the distances they cover. A species of swift, akin to our chimney swallow, flies, it is said, two

hundred and fifty miles an hour, or with a velocity eight or nine times as great as that of most express trains on our railroads. Were it possible for such a flight to be continued twelve hours, it would carry the bird across the Atlantic. If a man were struck by a wind moving at half this speed, he would be dashed violently to the ground.

We may have wondered sometimes at birds floating so long in the air, without a fanning movement of the wings. The momentum of their recent flight bears them along; and the widespread wings, being tipped downward in the rear, meet the air obliquely, and, by deflecting it, exert a lifting force equal to that of gravitation. If, in floating, a bird tips his wings farther downward in the rear, he rises; if less, he sinks; if struck by an opposing gust of wind, he is suddenly raised; or, if met by a gust obliquely, he is turned to one side. Yet, if one diligently watches birds on the wing, he soon finds there are mysteries of flight he cannot explain.

The capacity of some birds for inhaling and forcibly exhaling a great volume of air explains in part their phenomenal strength of voice. The notes of a nightingale are heard farther than the music of the human voice, and the call of a crow farther than the bellowing of an ox. Even the cry of an ostrich is as resonant as the roar of a lion. But the vocal power of birds is peculiarly augmented by the breadth and strength of the windpipe and by an ample cavity at its base, the walls of which are remarkably vibratory.

The beauty of birds consists largely in the richness of their plumage — the varied and exquisite tints of which, in multitudinous species, are almost beyond conception. Not only is the coloring delicately shaded and harmonious, showing admirable contrasts of the brighter hues with those that are quiet and subdued, but occasionally there is a metallic luster of unusual splendor. This luster is particularly noticeable in many tropical species, especially in the humming bird and pheasant families. We see it in our barn fowls and domestic pigeons, and admire it in the eye-spots of the peacock's plumes.

But the most gorgeous coloring is seen in well-watered parts of the globe where light and heat are most intense, or where the sunbeams paint plumage and flowers alike with their brightest hues. How amazing is the variety of colors in birds — scarlet, gold, azure, purple, crimson, pearly white, roseate pink, vivid green, and shining black, commingling and mellowing into each other in the most delightful combinations! And how beautifully, too, does Nature distribute the coloring — in bands, stripes, patches, dots, circles, wavelets, and specks — with perfect freedom from stiffness of outlines!

Tropical South America and the East India Islands, glowing beneath the rays of an almost vertical sun, are, beyond comparison, the paradises of the feathered tribes. Yet Nature, in her endowment of the birds, as in other gifts, has her compensations; for what they gain in beauty of plumage, they generally lose

in sweetness of song. Only in the temperate zones do we hear the most melodious notes.

Birds of some species are most beautiful when on the wing; since then they display brilliant colors which at other times are hidden beneath their pinions. The varying light and shade, as they fan their way through the air, now rising, now falling, now turning hither and thither, gives an exquisite variety otherwise impossible. In the tropical regions, where birds often move in flocks, they sometimes descend upon the trees or the ground like a floral shower.

In a majority of species, the male bird is most brilliant; but in some, his superiority disappears soon after the season of mating and rearing the young.

The character of the plumage, as respects texture, density, etc., varies according to climate and modes of life. In birds which are incapable of flight, as, for instance, the ostrich and penguin, the feathery covering is imperfectly developed, and, in part, resembles the hairy coats of certain quadrupeds. Aquatic birds are closely feathered; and have posterior glands secreting abundantly an oily substance with which they anoint their plumage, to prevent its wetting through. Nearly all such birds have a glossy coating. Some have feathers suggestive of the furry coats of the otter and seal; many, in cold climates, are clothed with a layer of down, next the skin, which is especially thick about the breast, where, but for its presence, there would be a liability, in

rapid swimming, that the water would be forced through the protecting covering so as to chill the bird.

All birds have oil glands, with the secretions of which they smear their plumage to preserve its luster and softness and protect it against the rain.

Some of the feathers serve a useful purpose beyond that of clothing. In the wings and tail, they are elongated and many take on the well-known quill form and overlap each other in such a manner as to be helpful in propelling or sustaining and guiding the body in flight. The larger feathers, which thus co-operate, interlock at the sides, by means of regular rows of slender hair-like teeth, and thus oppose a stronger resistance to the air.

Some birds, remarkable for their powers of flight, are able to inflate the tubular bodies of their quills so as to increase their internal air-supply when long on the wing. By means of such inflation, the erectile crests of certain birds are uplifted at pleasure, enhancing their beauty and giving to them a peculiarly sprightly appearance.

The long tail-feathers of the woodpecker family and of certain other birds which are known as climbers are pointed at the lower ends with sharp horny tips which help to sustain the bird in a vertical position as he clings to the side of a tree. These points are particularly useful in upholding and steadying the woodpecker while he pecks his hole in a decayed tree-trunk.

In general, birds shed their feathers once a year; some, twice a year, especially certain male birds which are more gaily plumaged than their mates, and which seemingly are obliged to tone down a little within a few months after the beginning of their matrimonial relations.

The senses of the feathered tribes differ materially in acuteness from those of man and of the quadrupeds. It is believed by many naturalists that birds are without the sense of touch; and it is admitted by all that their sense of taste is imperfect and perhaps, in some instances, totally wanting. Except in those that feed on flesh, the tongue and palate are hard or nearly cartilaginous. They swallow without mastication and seemingly with no perception of flavor. Yet it is possible that, during the process which the food undergoes in the first stomach or crop, there is a sensation akin to taste.

Especially is the sense of smell in birds much inferior to that in quadrupeds. It was formerly supposed that the scent of the vulture was remarkably acute, and that he was guided by it in detecting the presence of decaying carcasses; but it is now known that he cannot smell even carrion through the crevices of a wicker basket containing it, although the noisome odor may be as manifest to human nostrils as when the flesh is exposed in the open air.

But, on the other hand, the vulture's sight is telescopic. From the heights to which he soars, beyond the reach of the naked eye, he clearly sees, stretched

upon the earth, such objects as will afford him an agreeable repast; and

> " Coming from the invisible ether,
> First a speck and then a vulture,"

he descends upon his foul prey and gorges himself with the loathsome flesh.

Many other birds possess telescopic sight, and nearly all are remarkable for their strength of vision. The sparrow-hawk sees a small bird upon the ground twenty times as far away as it can be seen by a man or a dog. The rapacious kite, from an altitude nearly equal to that reached by the vulture, discerns a lizard or field mouse below, and drops down upon it in a nearly perpendicular line.

This acuteness of vision is highly serviceable in insectiverous birds, especially such as the night-hawks, which seek their prey during the hours of darkness.

The sense of hearing in birds is superior to that in quadrupeds, and is scarcely excelled by that of the human ear. This fact is shown by the readiness with which many catch and repeat the most varied tones. The parrot and mocking-bird are not alone in such quickness.

I well remember, in my childhood, a parrot belonging to a seamstress who was in the habit of singing as she sat by her window, plying her needle. Often, as I passed, I heard the parrot accompanying her in her songs; and sometimes, independent of his

mistress, repeating several tunes with facility and correctness.

Unlike mammals, birds are incapable of bringing forth living offspring, but produce their young only from eggs which are deposited from the body and subsequently hatched. As a group, therefore, they are termed *oviparous* creatures, in contradistinction to those which bear living offspring, and which are called *viviparous*.

It was once stated, as an established principle of natural history, that *"all life is from the egg"*; but it is now thought to be otherwise with infusoria of a primitive type that are one-celled and protoplasmic. In the case of birds, the process of development from the egg is easily observable; since individual eggs can be broken and examined at different stages of hatching. By such inspection, the foundations of the science of embryology were long ago laid — a science of the utmost value in determining the true classification of animals according to their rank.

The study of embryology has shown, for instance, that there is a common structure of the primitive egg in all vertebrated animals; and that, in the process of development from this structure, various metamorphoses occur, from the lower forms of vertebrate life to the higher. In the hatching of birds' eggs, it has been found, there is a gradual progression from the primitive embryo through a fish-like structure and then a reptile-like structure before the bird form is attained.

Professor Agassiz pointed out that what are to become the legs and wings of the bird are first formed, within the egg, as fins; also that what are to become the heart and lungs are first formed much like the organs which perform a similar office in the fish. He likewise directed attention to the fact that, in the hatching of the eggs of birds that are classed as *insessores*, or perchers (which, in the opinion of many naturalists, constitute the highest order of the feathered tribes), there is a stage of development akin to that of a much lower family, namely, swimming birds, or birds which have webbed feet, suggestive of the webbed fins of fishes.

Scientists of the present day refer to such facts as in a measure confirmatory of the theory of evolution.

Birds have been variously classified according to their structure and habits. Most of the classifications have reference especially to the beak, legs and feet. One of the simplest divides them into four orders, viz., perchers, climbers, waders, and swimmers. Another, which has been much used by British ornithologists, divides them into five orders, to wit: (1) *insessores*, that is, perchers, or those having prehensile feet suitable for clinging to the limbs and twigs of trees to afford them support, as the sparrow and robin, — (2) *raptores*, or rapacious birds, which have retractile claws capable of seizing or snatching their prey, as the hawk and eagle, — (3) *natatores*, or swimming birds, which have webbed feet and generally legs of moderate length, as the duck and goose, —

(4) *grallatores*, or waders, which in most instances have partially webbed feet and long legs, also prolonged jaws, as the stilted plover and crane, — (5) *rasores*, or scratchers, with feet especially fit for walking and scratching, as the pigeon and common barn-fowl.

Recent American writers, however, prefer a subdivision into ten orders. But a description of these, within the limits of the present paper, is hardly practicable.

Orders are divided into families, and families into genera and species. Some of the orders also are divided into sub-orders; and a few families, into subfamilies. The whole number of species of birds is probably about six thousand.

In the classification of birds by Elliott Coues, one of our most intelligent writers on the feathered tribes of North America, the order, *passeres* (which is nearly correspondent to the *insessores* or perchers of British ornithologists) is subdivided into *oscines*, or singing birds, and *clamatores*, or those which are noisy and unmelodious.

The singing birds are placed by most writers at the head of the feathered tribes. Professor Newton, of the University of Cambridge, England, — following other ornithologists of distinction, — maintains that the *corvidæ*, or crow family (which are classed with singing birds, although unmusical), are entitled to the first rank; and that, of this family, the Northern Raven is the foremost. Professor Parker, whom he quotes,

says: "The crow is the great sub-rational chief of the whole kingdom of the birds; he has the largest brain, the most wit and wisdom. . . . As that speaking, singing, mocking animal, man, is the culmination of the mammalian series, so that bird in which the gifts of speech, song, and mockery are combined must be considered as the top and crown of the bird-class." The learned professor doubtless had in mind the qualities of the crow which are made conspicuous in Poe's poem of "The Raven."

> "Though thy crest be shorn and shaven,
> Thou, I said, art sure no craven;
> Ghastly, grim, and ancient raven,
> Wandering from the nightly shore, —
> Tell me what thy lordly name is
> On the night's Plutonian shore!
> Quoth the raven, Nevermore."

The northern raven is rare in New England, although occasionally seen along our coast. He closely resembles the common crow, but is somewhat larger. It has been said that he is "preëminent in the list of sinister birds, or those whose only premonition is the announcing of misfortunes"; that he was invoked by our Southern aborigines; and that the natives along the Missouri River, who assume black as their emblem of war, decorate themselves with his plumes when preparing for strife.

Linnæus remarks that, in southern Sweden, "when the sky is serene, the raven flies very high, and utters a hollow sound — like the word *clong* — which is heard to

a great distance; sometimes he has been seen in the midst of a thunder storm with the electric fire streaming from the extremity of his bill — a natural though extraordinary phenomenon, sufficient to terrify the superstitious and to stamp the harmless subject of it with the imaginary traits and attributes of a demon."

Among our American songsters, the thrush family stands at the head.

The mocking-bird, which is the most wonderful of this family, is unrivaled in the whole wide world for variety, brilliancy and sweetness of notes. He is not merely an imitator (wonderful as we know his imitative capacity to be); but has a marvelous and superb range of his own exquisite song, in comparison with which the notes of the English nightingale are a plain and simple lay. The mocking-bird is a trifle larger than our common robin, and is attired merely in ashen gray, marked with white.

Among New England birds, the wood thrush is the sweetest songster. I shall never forget my delight when, on my way, in boyhood, at morning or evening, to or from the cattle pasture, I heard his prolonged plaintive whistle coming from the depths of the solemn woods. It was like a strain from the heavenly sphere. Often I wandered into the thicket, hoping to catch a glimpse of him; but seldom was I rewarded; for he is very retiring in his habits. At my first sight of this simple brown bird — white beneath, with dusky spots — I could hardly believe that such celestial

melody could come from a little being, so plain, so shy, and so humble.

The hermit thrush is scarcely inferior to the wood thrush in sweetness of notes.

But of all the merry song-birds which visit us, the bobolink is easily the chief. He pours forth an irresistible flood of laughing, liquid melody; and, as he wings his way from tree to bush, uttering his prolonged warble, his throat trembles and swells almost to bursting. Yet only the male bird is tuneful; and, after the season of incubation is past, and the nestlings begin to spread their wings, his song grows less frequent, and, early in July, is hushed. At the same time, he begins to lay aside his nuptial or pied dress, and take on a simple plumage similar to that of the female. Near the middle of August, he sets out for the South, where he fattens on wild rice along the river-borders, and, under the name of the reed-bird or rice-bird, becomes a favorite game for the sportsman. The poet, Bryant, has well described him: —

> " Robert of Lincoln is gayly dressed,
> Wearing a bright black wedding coat;
> White are his shoulders, and white his crest;
> Hear him call, in his merry note,
> Bob-o'-link, bob-o'-link,
> Spink, spank, spink, —
> Look, what a nice new coat is mine,
> Sure there was never a bird so fine, —
> Chee, chee, chee.
>
> " Robert of Lincoln's Quaker wife,
> Pretty and quiet, with plain brown wings,

Passing, at home, a patient life,
Broods in the grass while her husband sings
Bob-o'-link, bob-o'-link,
Spink, spank, spink;
Brood, kind creature, you need not fear
Thieves and robbers while I am here, —
Chee, chee, chee.

. . . . . .

"Robert of Lincoln at length is made
Sober with work and silent with care;
Off is his holiday garment laid, —
Half-forgotten that merry air,
Bob-o'-link, bob-o'-link,
Spink, spank, spink.

. . . . . .

"Summer wanes, the children are grown;
Fun and frolic no more he knows;
Robert of Lincoln's a humdrum crone:
Off he flies; and we sing, as he goes,
Bob-o'-link, bob-o'-link,
Spink, spank, spink, —
When you can pipe that merry old strain,
Robert of Lincoln, come back again."

We must not forget the meadow lark as one of our most charming songsters. When the morning sun shoots his glittering shafts across the dewy meads, scattering myriad diamonds in his path, and the fragrant breath of newborn day is wafted through our chamber windows, we hear his joyful lay, and, looking out, we see him rising on swift wing and pouring forth such a hymn of praise as only the God of all things can inspire in the heart of a happy bird. The meadow lark is not less beautiful than tuneful and vivacious.

One other song-bird we delight to hear is the little chickadee, as he comes in flocks to our dooryards in winter. His cheerful notes remind us that earth's snowy mantle is not a winding sheet for all Nature, but that there lingers in her coverts many a happy creature, ready, with the first touch of returning warmth, to bring new life to our familiar haunts.

Among other birds, of cheerful notes, which we rejoice to behold as summer invites us abroad, are a few that linger in sylvan retreats, as the ruby-crowned wren, and others which occasionally display their attractive plumage beyond the woodlands — as the yellow or thistle bird, the indigo bird, the rose-breasted grosbeak, the cardinal grosbeak, the scarlet tanager, and the red-winged blackbird.

Bidding adieu now to the song-birds, I may mention a few of various species which especially interest us by their sprightliness, their lovely plumage, their impressive mien, or their peculiar habits.

Among the most charming are the little humming birds, so tiny and so fairylike that they seem to belong almost to a spiritual realm. Tropical America is peculiarly the land of the humming bird, containing nearly four hundred species. But few, on the other hand, are found in cooler climates. Of these, the best known, perhaps, in the United States are the ruby-throated and the rufus. The smallest of all the humming-bird family is about the size of a humblebee; and its egg, hardly larger than a pinhead. How eagerly do we watch these dainty creatures as, borne

The Chickadee

on whirring wings, they thrust their cleft tubular tongues into the honey cups of the flowers! So swiftly do they dart to and fro, that they seem little else than flitting gleams of misty light.

A word about our chimney swallows. They are marvelously swift on the wing, and we wonder, as we see them gather in flocks and seek their sooty habitations, that they can be content with such dwellings. But their natural home is in the hollow trunks of decayed standing trees. It is astonishing how many will gather in a single trunk.

Audubon tells of a colony which inhabited a large hollow sycamore, near Louisville, Kentucky. He says: "I rose early enough to reach the place long before the least appearance of daylight, and placed my head against the tree. All was silent within. I remained in that position probably twenty minutes, when suddenly I thought the great tree was giving away, and coming down upon me. Instinctively I sprang from it, but, when I looked up, . . . what was my astonishment to see it standing as firm as ever. The swallows were now pouring out in a black continued stream. I ran back to my post, and listened in amazement to the noise within, which I could compare to nothing else than the sound of a large wheel revolving under a powerful stream. It was yet dusky, so that I could hardly see the hour on my watch; but I estimated the time which they took in getting out at more than thirty minutes. After their departure, no noise was heard within, and they dispersed in every

direction with the quickness of thought." He estimated their number at not less than nine thousand.

Chimney swallows, it is said — although the statement may be questionable — never rest except in their dark nesting places — to the walls of which they cling, partly supported by their stiff tails. On entering a chimney, they fall boldly, head foremost. A few years ago, a colony of such swallows resorted to an unused chimney in a house near where I live. Some time later, a smoldering fire was lighted on the hearth, and, as a result, many of the poor birds were stifled with the smoke. Nearly a bushel of their little bodies is said to have been gathered up and carried away.

Among our prettiest and sauciest summer visitors is the cherry-bird, or wax-wing. His smooth yellowish-brown plumage, his black-barred forehead, his long pointed crest and his yellow-tipped tail give him a strikingly trim and dashing appearance. He is a voracious feeder. I have seen him gorge himself with mountain-ash berries till he tumbled on his side and his crop ejected them. Yet he returned immediately to the tree and ate again to surfeit.

A curious member of the shrike family, often seen in New England, is the butcher bird. He is so-called from his habit of impaling insects on thorns, and leaving them for a future repast. He is a bold bird; and, although scarcely larger than the robin, often attacks and destroys smaller members of the feathered tribes. In defense of his young, after they have learned

to fly, he even attacks the hawk and the eagle with such fury as to drive them away.

Of the finch family — to which the yellow bird, indigo bird, purple linnet and grosbeak belong — the red cross-bill deserves special mention. He has a scissors-like beak which is peculiarly useful in dividing seeds and other hard substances on which he feeds.

The finch family are like a bright floral group among our more somber birds — rich with crimson, scarlet, rose, blue, purple, yellow, brown, ashen grey, white and black. The crested red-bird, or cardinal grosbeak, is the most striking member of the family, and is beautiful, both in dress and in song.

Perhaps the most mischievous bird in New England is the blue-jay. He belongs, notwithstanding his attractive plumage and showy crest, to the same family as the crow, and evinces a similar intelligence. So capable is he of mimicry that he can be taught to talk. The blue-jay is a general disturber of the peace. He destroys the eggs of other birds, kills their young, worries owls when blinded by the glare of day, teases hawks, and often scatters small birds by imitating the cries of their rapacious enemies. In destroying grain, he is quite the rival of his sable relative, the crow.

Of the woodpecker family, the most beautiful in New England is the golden-winged woodpecker, or yellow hammer, often called the flicker. When unmolested, he occasionally makes his nest in the decayed trunk of a tree near a dwelling house. One of the saddest recollections of my boyhood is that of

capturing a brood of young yellow-hammers in a neighboring orchard, just as they were ready to fly, and, after confining them in a cage, forgetting to give them water, and thus causing them to perish with thirst. How keen was my grief when I found them lifeless, with their long beaks agape and their stiffened tongues thrust out as if begging for a drop of moisture!

No bird was better known formerly, in the United States, than the wild pigeon. In the early half of the nineteenth century, the immensity of its flocks, in some parts of the West, especially at the periods of migration, seemed almost incredible. Wilson, the distinguished ornithologist, describes a flock he saw, stretching farther than the eye could reach in every direction, and moving overhead on swift wing, with but little break, for upwards of five hours. He says it contained, at the very lowest estimate, more than two thousand million birds. His statements respecting such flocks are amply corroborated by those of Audubon and other ornithologists.

A recent writer remarks: "The numerous flocks are without any parallel in the history of the feathered race; they can indeed alone be compared to the finny shoals of herrings which, descending from the Arctic regions, discolor and fill the ocean to the extent of mighty kingdoms. The approach of the feathered army, with a loud rushing roar, attended by a sudden darkness, might be mistaken for a fearful tornado about to overwhelm the face of Nature. The whole

air is filled with birds; and they shut out the light as if it were an eclipse."

I forbear to mention in the present paper the many kinds of game birds within our national limits. It may be well, however, to remind you of the wild turkey, which is indigenous only in America, and which, having been domesticated, has furnished an invaluable contribution to our poultry yards.

Among rapacious birds, we have several species of eagles, many of hawks and owls, various crows, and the useful but offensive turkey-buzzard. The latter, in our Southern States, is a valuable scavenger; and is often seen hopping about in the neighborhood of meat and provision markets, as freely as if he were a domestic fowl.

In appearance, the golden eagle and the bald, or white-headed, eagle are the noblest species of birds seen in New England. The dwelling place of the golden eagle is chiefly in mountain fastnesses or in the wilderness. Although now becoming rare, he is seen not infrequently among the White Mountains, where he builds his eyry on almost inaccessible crags. He is the venerated war-eagle of our northern aborigines; and his tail feathers were once prized by them for talismanic head-dresses and as sacred decorations for their pipes of peace. The range of the golden eagle is over a large part of the north temperate zone, including much of Europe and Asia as well as America. From the loftiness of his flight, he was formerly believed to aspire beyond the sun; and accordingly was

fabled, by our ancestors in southern Europe, to hold communion with Jove and to serve as his messenger. The Romans adopted the golden eagle as the emblem for their imperial standard, which certainly was befitting, not only because of his royal mien, but of his rapacity.

The bald eagle is most common along unfrequented parts of our coast and about the borders of inland lakes. He builds his nest, of dry sticks and coarse grass, sometimes on a cliff, but usually in a lofty tree. His food is chiefly fish; while that of the golden eagle is principally land creatures. Both reject carrion, unless driven to it by extreme hunger. Each, when full grown, spreads his wings to a breadth of between six and seven feet, and is capable of bearing away in his talons lambs, young pigs, and even children two years old.

The largest bird which comes within the limits of the United States is the white or wandering albatross. In fact, he is the largest of all flying fowls, measuring, in some instances, fourteen feet or more from tip to tip of his expanded wings. He is seldom seen within our borders; except on the Pacific Coast, where he is only a casual visitor. Often he follows vessels, for the food he can gather in their wake; and such is his power of long continued flight that sailors believe he sleeps on the wing. Coleridge's "Ancient Mariner" is founded on a superstition relating to the wandering albatross.

Within our southern border, are a few birds of a subtropical character. Among them, the most no-

ticeable formerly was the Carolina paroquet, an exquisite little creature, of green and gold color, with long and beautiful tail feathers. A similar paroquet has lately been sold by strolling Italian girls on the street corners in some of our northern cities. He perches upon their fingers or on a stick held out to him, and shows no disposition to fly away.

The Carolina paroquet is easily domesticated, and is affectionate toward those who treat him kindly. But, as he is destructive of fruit and grain, the farmer is his enemy. His beautiful plumage, too, has made him an object of attack, and already he has become quite rare. A recent writer says: "Woman's vanity and man's greed have joined hands to carry on the slaughter. From the combined attack of such foes, the remnant has but slight chance of escape."

I first saw flocks of paroquets in Florida along the romantic borders of the Ocklawaha River. They passed over my head like fairy blossoms blown from Eden. I was inexpressibly delighted. They belong to the parrot family, which is peculiarly abundant in America, but they are of a humble genus, and probably could not be taught to talk.

In conclusion, let me utter a plea for the birds. Destroy them not, ruthlessly, so beautiful, so joyous, so full of song. Life must be as sweet to them as to us. Nature gave them for our continual delight.

> "He prayeth best who loveth best
> All things, both great and small;
> For the dear God who loveth us
> He made and loveth all."

VIII

WHAT TO READ AND HOW TO READ

The world is full of books. Single libraries contain over a million volumes. Not less than fifty thousand new books, a year, are launched upon the public. Over twenty thousand of these are in our mother tongue.

Who can read seventy volumes a day? Yet this is what would be required, merely to keep pace with current English literature, exclusive of magazines and newspapers. Shall we sit down in despair, wrapping ourselves in the gray mantle of illiteracy; or shall we wander forth into Elysian fields, and gather what we can of the rich harvests of thought? Attempting the latter, what shall be our course, what, our principle of selection?

The problem of What to Read and How to Read has confronted scholars ever since the first century following the invention of the modern art of printing. Locke and Bacon dwelt upon it with philosophic acumen; Montaigne dallied with it; Dr. Johnson talked profoundly of the matter; Coleridge discussed it in his brilliant criticisms; the genial Lamb gave us "Detached Thoughts on Books and Reading"; Carlyle indulged in sphinx-like utterances on the subject; and Emerson left us a valuable legacy in his essay on "Books."

Other able writers, many of them now living, have given us partial solutions of the problem. Yet, every year, it grows more serious, as the habit of reading becomes more general, and as books multiply at a rate faster than populations.

Emerson lays down for us three golden rules: —
Read only famous books.
Read only books which are a year old.
Read only books which you like.

These rules are meant, however, for readers of some culture. They are not without exceptions. The mental character, attainments and purposes of the reader must always be considered. The list of books which would be suitable for one would be as unfit for all, as the bill of fare at a dinner table that would satisfy one would be undesirable for all.

In general the rule, "Read only famous books," should be attentively regarded.

Joseph Cook, who was widely read, as well as philosophic, said: "There are only about one thousand first-class books in the English language; certainly, not over a thousand that deserve reading three times through": one "can put into a bookcase, five feet square, the volumes which contain the chief weight of English literature: of the greatest books, there are not over a hundred in the mother tongue in which any man is born."

If a scholar, familiar with literature, sits down to the study of a catalogue prepared by a skillful bibliographer for a private library adapted to general

wants, and checks off those books only which, in the wide world of choice reading, he may find it well to go three times through, — bearing in mind that each re-reading requires the neglect of other profitable reading, — I think Mr. Cook's statement will be found correct.

In poetry, for instance, observe the really great names: Homer, Virgil, Dante, Shakespeare, Milton, Goethe; some would add Æschylus and Sophocles.

In other departments of literature, if we look for corresponding names, how small is the list!

Yet the writings of many, whose names would not be included with the foregoing, are, to a great extent, admirable and well worthy of attentive study. But is it not best to seek familiarity with the great authors first? Those who wrote in languages with which we are unfamiliar may be read in translations — less satisfactory, it is true, than the originals, but still preserving much of their beauty and spirit. It may be well, often, to compare several different translations; for where one is imperfect, others may be excellent. In reading Dante, for instance, we may be helped by comparing Pollock's, Cary's, Longfellow's Parson's, Warburton Pike's, John A. Carlyle's and Norton's translations — the two latter, prose renderings.

Age gives to the best books the stamp of unquestionable approval. There is a quaint Spanish saying:

> " Old wood to burn! Old wine to drink!
> Old friends to trust! Old books to read! "

A year from the publication of a book is no great time to wait. Such waiting may, in the long run, save us a decade of years.

A second-rate book, however excellent, is a mischief, if it takes time that should be given only to a first-rate. It is well to remember the German proverb, "The better is a great enemy of the best."

Never be concerned because you are unable to keep pace with current literature. You can read but a very small part of it — even with the utmost diligence. If you take the choicest, only, you will have all you can master, and you may be congratulated at escaping a world of rubbish.

Sir William Hamilton says: "Read much, but not many works." *Multum, non multa!* This is the rule of the most distinguished scholars. It is not the amount you read, but how much you make your own, that tells on your life and character.

Nothing should be considered more attentively, in one's reading, than character building. Men are great oftener by their moral force than by their genius or learning. Seldom are they better than the books they read. Shun bad books, as you would shun poison; or, if you read them at all, do so chiefly that you may mark their faults, and aid in correcting their evil influence.

The bane of our present literature is the flood of degrading novels and reckless story-papers which picture vice in seductive forms and give to the worst characters a touch of heroism. Some years ago, it

was said that about thirty flash newspapers were published in New York City alone, and that they had over three million readers. Teachers of public schools say, the most unruly and rebellious boys are those who revel in such trash. Children should be taught that the dime novel is vulgar, and the cheap story-paper a disgrace.

Emerson's rule, "Read only what you like," was not meant to restrict readers to what is most entertaining, but only to what is of such interest as thoroughly to command their attention — such interest, too, as springs from a wholesome craving, and not from an appetite already debauched by careless and unprofitable reading. It has been well said that interest is the mother of attention, and attention, of memory; therefore, to secure memory, secure its mother and grandmother. A queenly personage is Mother Interest! She asserts her sovereignty over us from our birth; and never abdicates, as long as we are conscious.

Of other principles to be regarded in our choice of reading, it may be said: —

One of the first things to be thought of, after influence on character, is, What do we most need to know? Having a practical end in view is a great incentive to effort; we contend for a golden prize — not for what may vanish into nothingness.

Read a variety: religious, political, social, literary, scientific, artistic. A broad culture makes a stronger and more liberal man.

If information is desired on subjects about which

knowledge is steadily increasing, be careful to seek out the latest, approved books. Never read an antiquated book on any art or science, however good in its day, unless you read it as history. Get the best that has been written in each branch, by authors of recognized merit, usually within the last ten years.

Be on your guard against charlatanry and pretense.

Without neglecting what is best in the past, do what you can to keep abreast with the times by reading a *few* good newspapers and magazines. But cull their contents with the utmost care. A voyager in such literature should be what the captain of a fishing smack is to his craft — a good skipper. Hosts of persons are frittering away time enough in newspaper reading for the acquirement of a valuable education. Pass over the idle gossip, bitter political controversies, careless conjectures, ordinary criminal records, and foolish sporting news; but not over the great events of current history or the discussions of the important social, scientific and religious questions of the day. The best thoughts of the ablest living writers relate to the latter subjects, and are commonly found in first-class public journals.

After the study of the lessons of Holy Writ, that of history is undeniably the most profitable. History is the record of human experiences. It acquaints us with the wisdom and the follies of the past. It is a "lamp to our feet and a light to our path." True! it is imperfectly written; yet, in spite of its imperfections, it presents to us, on the whole, such an epitome

of valuable lessons — such a storehouse of illuminating truths for the guidance of our lives — as can be found nowhere else except in the Bible.

Biography is inseparably associated with history. The two must be read together. Courses of reading, prescribed by able scholars in general literature, allot more than half the time to history and biography.

Underlying history, is geography. The former never can be intelligently understood without a good knowledge of the latter. The growth of nations, the character of their industries, the lines of their material and social progress, are determined largely by the physical conditions to which they are subject. Extravagant as the assertion may seem, it can be clearly shown, for instance, that the semi-civilization of the Tartars and the Bedouins — their nomadic habits, their want of learning, their lack of acquaintance with the arts and sciences, their patriarchal forms of government, and their warlike and predatory dispositions, all, are due in good part to local conditions which deprive the countries they inhabit, except in a few limited districts, of such a supply of rain as is needful for agriculture, and thus leave them dependent for support mainly upon the care of flocks and herds with which they wander hither and thither in search of sufficient pasturage. So on the other hand, it can be shown that the greatness of ancient Greece and Rome and the precedence of modern England are due in a good measure to the native resources and fortunate environments of their original domains.

A broad survey of the world, in respect to its present resources, its means of progress, and its future possibilities, is impracticable without a knowledge of the physical sciences. Such knowledge opens to our view the depths of a vast universe, unlocks God's revelation of himself in material things, raises us to the loftiest contemplations, is the delight and exaltation of our youth, and may be the joy and ennoblement of our old age.

Who can refrain from poetry and fiction — from the *great* works of the imagination? They touch the springs of the human heart; they kindle the loftiest emotions; they appeal, with dramatic intensity, to our highest faculties.

But the world seems nearly crazed with fiction. Over two thirds of the books taken from public libraries are novels — three fourths of them of a visionary and sensational character. Yet the novel has its proper place, both as an instructor and entertainer. Sir John Herschel says it is " one of the most powerful engines of civilization ever invented." Anthony Trollope says: It has well nigh succeeded to the sermon, as a former of character. Considered as an adjunct of history, its value hardly can be overestimated. As to the historical element in Scott's novels, it was remarked years ago, by Professor Smythe, that Scott seems to have chosen the stone which the builders rejected, and it has become the head of the corner. The historic novel may be made the attractive portal to pure history; and may serve

even better than the latter for the portrayal of manners, customs, modes of life, typical character, and popular feeling.

Finally: *How shall we read?*

First and foremost, by subjects! Follow one book with another on the same or a kindred subject, until you have made yourself tolerably familiar with the department of learning to which it relates. Frequent turning from one subject to another, with which it has little kinship, prevents consecutive thinking, interferes with profitable reflection, forbids growing interest, begets carelessness of attention, weakens the memory through heedlessness and lack of association, and seriously hinders the acquirement of knowledge. Owing to these facts, much choppy newspaper-reading is unwholesome.

But do not pursue one subject so long and so exclusively as to make it a hobby; for the intellectual powers require varied exercise.

Before you finish a book, decide if possible what you will read next. In this way, you can always have a good book at hand, and your attention seldom will be diverted to a worthless one.

Attempt only books you are confident of finishing. Persist to the end.

Adhere to a well-devised system of reading; but do not be fettered by it.

Never say you are without time for reading. The trouble is not lack of time, but waste of time. Improve the odd moments. Not many years ago, I

knew a merchant's clerk in New York, who, in brief snatches of time from half-hour rides between his home and the store, learned three modern languages so successfully as to conduct correspondence in them for his employers. An English scientist of distinction, it is said, learned a language while waiting for his wife to complete her evening toilets.

Take solid reading when you are fresh; the lighter when tired. An entertaining book is often restful.

Read for inspiration as well as for pleasure and instruction. We, all, are affected in our moods by what we read. One of sensitive temperament can hardly read a play of Shakespeare or a book of Milton's Paradise Lost, without being conscious afterwards that somehow it has quickened his imagination and contributed to his excellence of speech. So he can scarcely read one of Emerson's essays, without experiencing a refinement of his own thought, or one of Webster's orations, without its kindling in his breast a feeling of patriotic devotion.

Read, to remember. Therefore, in general, read slowly, ponder and review. It is said of Edmund Burke that he read every book as if he were never to see it a second time, and thus made it his own.

Yet there are many valuable books which deserve only to be skimmed. Cultivate the faculty of glancing them over rapidly, taking only the cream. It is often needful to do this, in seeking information for immediate use. Some men have a remarkable faculty for thus appropriating the solid contents of volumes.

The omniverous Carlyle devoured an average of ten books a day. Gladstone is said to have read almost by paragraphs at a glance, and with wonderful comprehension.

It is an excellent practice to make notes of what we read, and to write on the subjects soon afterwards. It gives an exactness to our impressions such as hardly can be gained in any other way. Next to this, the best course is to talk over what we read, with persons interested in the subjects. As an aid to such practice, coöperative reading clubs are excellent.

Maintain the habit of reading throughout life; but allow reasonable intervals for mental rest and digestion. Be careful not to mistake the morbid cravings of the mind for intellectual hunger. If the brain grows weary, give it simple diversion. After a period of repose and of nursing with a sick-room diet, return seasonably to more solid nutriment.

In the lapse of years, well regulated habits of reading and reflection will make any sensible person a respectable, if not an accomplished, scholar.

IX

DANIEL WEBSTER'S ORATORY COMPARATIVELY VIEWED

Oratory is subject to no positive test. Its merit, so far as determinable, is measured not merely by the intrinsic excellence of what is said, but also by the manner of saying it and by its suitableness to the persons addressed. A speech fit for one body of men may be wholly unfit for another.

Rufus Choate once remarked of the orations of Demosthenes — the prime characteristics of which are their conciseness, their careful elaboration of thought and expression, and their freedom from ornament — that there was "not an audience in the United States, except the judges and lawyers of the Supreme Court, who could bear such condensation of matter." Yet Demosthenes confessedly stands at the head of all ancient orators. But it should be remembered that his orations were addressed to Athenian citizens at the period when Greece had attained its highest culture, and that his audiences consisted of men trained in public debate and educated to argue their own cases before the law courts.

Oratory has been defined as "the art of public speaking in an eloquent or effective manner." But the manner involves something more than the use of appropriate words; for a merely droning utterance

may be fatal to oratory. We must look beyond the words, however eloquent when read, and must consider their impressiveness when spoken, with all the glamour of the orator's presence, of his accompanying action, his tones of voice, his sympathetic touch of the audience, and his power of kindling in their minds and hearts the thoughts and feelings he seeks to inspire.

Perhaps no better statement can be made of what constitutes oratory than that of Daniel Webster in his address, in Faneuil Hall, in grateful tribute to the memories of Adams and Jefferson: —

> "When public bodies are to be addressed on momentous occasions, when great interests are at stake, and strong passions excited, nothing is valuable in speech farther than it is connected with high intellectual and moral endowments. Clearness, earnestness, and force are the qualities which produce conviction. True eloquence, indeed, does not consist in speech. It cannot be brought from far. Labor and learning may toil for it, but they will toil in vain. Words and phrases may be marshaled in every way, but they cannot compass it. It must exist in the man, in the subject, and in the occasion. Affected passion, intense expression, the pomp of declamation, all, may aspire to it; they cannot reach it. It comes, if it comes at all, like the outbreaking of a fountain from the earth, or the

> bursting forth of volcanic fires, with spontaneous, original, native force. The graces taught in the schools, the costly ornaments and studied contrivances of speech, shock and disgust men when their own lives and the fate of their wives, their children, and their country, hang on the decision of the hour. Then words have lost their power, rhetoric is vain, and all elaborate oratory is contemptible. Even genius itself then feels rebuked and subdued, as in the presence of higher qualities. Then patriotism is eloquent; then self-devotion is eloquent. The clear conception, outrunning the deductions of logic, the high purpose, the firm resolve, the dauntless spirit, speaking on the tongue, beaming from the eye, informing every feature, and urging the whole man onward, right onward to his object, this, this, is eloquence; or rather, it is something greater and higher than all eloquence, — it is action, noble, sublime, godlike action."

From the foregoing, it will be seen that Webster puts at the back of all oratory, as its most effective force, the intellectual and moral character and high purpose of the speaker as manifest to his audience. If these shine forth commendably in his person, they reinforce his words, and awaken feelings which language, alone, is powerless to produce. The manliness of the orator, as recognized by his hearers, is an element always to be considered; since from this, spring

the evident sincerity and strength of feeling which give nobility to his presence, significance to his action, and profound impressiveness to his elocution.

Daniel Webster was a man of superlatively majestic presence, the most majestic man I ever saw. Well do I remember his looks as he stood on the platform when honored with a public reception in Boston, a while after his famous "Seventh of March Speech." I recall vividly his stalwart form, his massive head, his great eyes flaming out from their dark cavernous sockets, his noble poise, his sovereign grace.

> "Deep on his front, engraven,
> Deliberation sat and public care";

and in his face, a princely counsel shone.

The portentous expression of the whole man thrilled me through and through; and when he began speaking, with his rich sonorous voice, his sweeping gestures and his splendid mien, I was spellbound. Yet his words were few and simple, but little more than an expression of deep gratitude for the recognition of his late self-sacrificing effort in the Senate, to stay the tide of dissension then sweeping over the country and threatening to break up the cherished union between the states.

More than twenty years before, he had sounded a clarion note of warning, in his Speech in Reply to Hayne, when he said: —

> "I profess, Sir, in my career hitherto, to have kept steadily in view the prosperity and honor

of the whole country and the preservation of our Federal Union. It is to that Union, we owe our safety at home and our consideration and dignity abroad. It is to that Union that we are chiefly indebted for whatever makes us most proud of our country. . . . While the Union lasts, we have high, exciting, gratifying prospects spread out before us, for us and our children. Beyond that, I seek not to penetrate the veil. God grant that, in my day at least, that curtain may not rise! God grant that, on my vision, never may be opened what lies behind! When my eyes shall be turned to behold for the last time the sun in heaven, may I not see him shining on the broken and dishonored fragments of a once glorious Union; on States, dissevered, discordant, belligerent; on a land, rent with civil feuds or drenched, it may be, in fraternal blood! Let that last feeble and lingering glance rather behold the gorgeous ensign of the Republic, now known and honored throughout the earth, still full high advanced, its arms and trophies streaming in their original luster, not a stripe erased nor polluted, nor a single star obscured, bearing for its motto no such miserable interrogatory as 'What is all this worth?' nor those other words of delusion and folly, 'Liberty first and Union afterwards'; but everywhere, spread all over in characters of living light, blazing on all its ample folds, as they float over the sea and over the land and in every wind

> under the whole heaven, that other sentiment, dear to every true American heart — Liberty *and* Union, now and forever, one and inseparable."

These are the words of a patriot, of a broad-minded statesman, rising high above sectional prejudices and seeking the good of the whole country. They appeal to the loftiest motives — to the love of family and kindred, to the desire for domestic tranquillity, to regard for cherished possessions, to pride of nationality, and to the hope of a glorious future. They are uttered in solemn admonition; and behind them, is a sterling manliness that is instantly and powerfully felt.

Almost from the beginning of his public career, Webster maintained the inviolability of the Union. To the end, he remained its foremost champion.

His Speech in Reply to Hayne is regarded as his most consummate effort. By this, therefore, as a standard, we may measure his oratory — so far as may be practicable by a single speech — with that of any other of the great orators whose resonant tones vibrate through the centuries. At the time of its delivery, Webster was forty-eight years old, and in the full maturity of his powers as a public speaker.

It may be proper for us to pause, a moment, while we take an inventory of these powers. Besides the advantage of an imposing presence, he had unusual dramatic talent, always held in judicious restraint, to guard against anything like a theatrical quality. Yet it was said of him by his friend and most familiar

legal opponent, Jeremiah Mason, that, in Webster, a great actor was lost to the stage. His voice was a rich baritone, of remarkable volume and compass, peculiarly thrilling in its low tones, and of wonderful carrying power. It has been remarked that he was well heard, in one of his Bunker Hill orations, by over thirty thousand persons. That his elocutionary ability was superior is well attested; and that he used it occasionally with great impressiveness, there can be no doubt. Mr. Lodge, his biographer — who is careful to avoid excessive praise — thinks that Webster's physical equipment for oratory probably was beyond that of any other of the world's great speakers known in history.

His dignity as an orator was supreme; under no circumstances was it carelessly laid aside. His equanimity was nearly perfect. Provocation almost never caused the loss of his temper or betrayed him into indiscretion; it incited only to a higher use of his powers. While the storm might rage within and strongly impel him, he kept a firm grasp upon the helm; and his momentum, therefore, as he bore down on his adversaries, was all the more crushing. Yet, even in the moment of victory, he showed a royal courtesy, and chose to spare rather than to annihilate. Never were these facts more conspicuous than in his Reply to Hayne.

Webster was a sincere lover of truth and justice; and continually showed a paramount regard for each. Calhoun said that he was " the fairest man, he ever

met, to state the position of his opponents." Persons who were familiar with his forensic efforts remarked that he seldom argued a case forcibly which he believed to be bad. His powers of irony and invective against unfairness and injustice were superb; and occasionally were supplemented with humor, although the latter was sparingly indulged.

Webster's imagination was strong — sometimes bold and free, — but usually reserved, and always chaste. Appropriate imagery adorned his speeches as rich sculptures adorn the crowning portions of a plainly walled Grecian temple.

Almost without exception, his forensic addresses, political speeches and special orations show rare constructive power, with the most careful regard for symmetry and logical strength. Seldom neglecting rhetorical graces, he always kept the chief end in view. To this fact — more, perhaps, than to any other — is due his remarkable success in carrying conviction to his listeners.

Webster was equally capable of clear thinking and clear expression. These characteristics were manifest especially in his discussion of abstruse subjects and in his handling of dry facts. His speeches on financial questions rarely lacked in popular interest; and were listened to as were those of few other orators.

Webster's ability in the choice of language was admirable. His words were, in good part, Anglo-Saxon, simple and forceful, set in brief sentences, and conveying his meaning with exactness and pre-

cision. In a newspaper report of one of his speeches, a few years before his death, I found but three words of more than two syllables, in half a column. The simplicity of his diction doubtless was gained chiefly during his early law-practice in New Hampshire, when opposed to Jeremiah Mason, whose plainness of speech was remarkable. Webster spoke slowly; owing partly to his temperament and partly to his care to express his thoughts in the best terms. Henry Clay, his great compeer in the Senate, spoke two words to his one.

Of the rare vigor of Webster's intellect — its nobility, its strength, its comprehensive grasp, its tenacious hold, — it is hardly needful to speak. No wonder he was sometimes called " The God-like Daniel."

Scarcely less surprising was his power of adaptation to his audiences and to the occasions. To judge fairly of his oratory, regard must be paid to the great variety of his efforts: his arguments before juries of unlearned men, his discussions of law-questions before the Supreme Court of the United States, his speeches in the Senate and House of Representatives, his eulogies of statesmen, jurists and chief magistrates; his orations on great occasions — as at Plymouth and Bunker Hill; his addresses at rural gatherings; his harangues during political campaigns; his talks to Dartmouth alumni in Washington, to brokers in Wall Street, to the Sons of New Hampshire in Boston, — in short, his addresses on the most diverse occasions, at conventions, mass-meetings, public cere-

monials, receptions, etc. No orator ever was called on for more varied efforts; and, in each instance, he was equal to the occasion; since, apart from his learning — gained in college, at the bar, in Congress, in the cabinet, and in social intercourse with the most cultured in the land, — he possessed the broad intelligence of a strong every-day thinking man, who, from early youth, earned his own living, who was a keen practical observer, who was in sympathy with men of all vocations, who well digested whatever he learned, and who had a wonderfully retentive memory. He read men as he read an open book, and his knowledge of human nature seemed almost supreme.

His public oratory began with a Fourth of July oration at Hanover, New Hampshire, during his last year in college, followed by a similar oration, two years later, at Fryeburg, Maine, where he taught a small country academy.

Webster was not a scholar in the technical sense; yet he was widely read, and possessed a vast store of information, especially touching matters of common life. Often he surprised others by his ample knowledge of subjects about which they presumed he was ignorant. On one occasion, during a familiar conversation, long after he had become distinguished in public life, he astonished his listeners by a learned discourse on mutton.

Webster had the courage of his convictions. He was unflinching in the performance of what he believed to be his patriotic duty. More than once he

lifted up his voice in behalf of the nation, as a whole, when he well knew that he was opposing, at a serious personal sacrifice, the wishes of a majority of those to whom he was indebted for his place in the Senate. Such was the case, it is believed, when he made his noted "Seventh of March Speech," relating to the "Compromise Measures of 1850." Weeks before, he had declared to Mr. Clay his purpose to express such views as are contained in this speech, — "no matter," he said, "what might befall himself at the North." His critics, however, claim that, under this compromise, his consent to the organization of Utah and New Mexico as territories — leaving the question of slavery within their limits to be determined afterwards by the settlers, in accordance with the principle of "squatter sovereignty" — was a distinct abandonment of a higher principle for which he had long contended. Yet repeatedly he declared, in his speech, that he deemed slavery a great moral, social and political evil, and that he was utterly opposed to its extension beyond the limits already prescribed; but, nevertheless, he would not insist on the immediate prohibition of slavery, by national enactment, in respect to the territories under consideration; because he believed it to be excluded from them by a law superior to any human enactment, namely, "the law of nature, of physical geography, the law of the formation of the Earth," and since he "would not take pains uselessly to reaffirm an ordinance of nature" or to "re-enact the will of God," and would

not favor putting into legislation any "evidence of the votes of superior power, exercised for no purpose but to wound the pride — whether a just and rational pride or an irrational pride — of the citizens of the Southern States," who must inevitably regard such an act as "a taunt, an indignity." Could reasons be more cogent, or better suffice for persons realizing, as he did, the utter impossibility of maintaining slavery in territories consisting chiefly of arid table-lands and mountain districts ill suited to agriculture?

Webster not only deprecated, but sought to allay, the growing bitterness of feeling between the North and the South; and, in his Seventh of March Speech, condemned alike the course of Northern and Southern radicals who were provoking this feeling. Threats of secession already had been made; and he clearly foresaw the evils which would arise from an attempted severance of the Union. He said: —

> "I hear with distress and anguish the word, 'secession,' especially when it falls from the lips of those who are patriotic, and known to the country, and known all over the world, for their political services. Secession! peaceable secession! Sir, your eyes and mine are never destined to see that miracle . . . he who sees these States now revolving in harmony around a common center, and expects to see them quit their places and fly off without convulsion, may look the next hour to see the heavenly bodies rush

> from their spheres, and jostle against each other in the realms of space, without causing the wreck of the universe. There can be no such thing as a peaceable secession. Peaceable secession is an utter impossibility. . . . It must produce a war, and such a war as I will not describe *in its two-fold character*."

This memorable speech in favor of compromise cost Webster the immediate loss of his popularity in the North and, a little later, his possible nomination to the presidency. But was his wisdom justified? Did his critics afterwards admit it? Only eleven years later, the most prominent of those who had censured him for his course in regard to the territorial organization of New Mexico and Utah — namely, Seward, Wade, Chandler, Sumner and others — consented to the organization of similar territories, without a word of proviso respecting slavery. They no longer sought to " re-enact the will of God." Yet the dissensions between the North and the South, which Webster had striven so hard to abate, went on increasing; until the war cloud he saw gathering, more than thirty years before, burst in all its fury, — and his forebodings of a " land rent with civil feuds " and " drenched in fraternal blood " were terribly realized. For the liberation of four million slaves, a million precious lives were sacrificed, more than ten thousand million dollars were lost, and untold sorrows were brought to countless homes. Daniel Web-

ster's courage and self-sacrifice, which had been so successful in averting other disasters, ill sufficed to stay the tide of controversy that brought on the Civil War. Yet, long before it came, Webster was laid to rest in the silent grave; and his fervent prayer was answered that he might be spared from beholding with mortal vision such an appalling catastrophe.

But was his sacrifice to no purpose? It has been well said, concerning the support he gave the Compromise Measures of 1850 — which afforded a partial satisfaction to both the North and the South, and thus served to postpone the threatened rupture until 1861, — that " those eleven years that he gained to the Union were of inestimable value for the final conflict." Can we doubt that, during those years, the ardent discussions which occurred in legislative halls, in widely circulated journals, upon public platforms and in private debate, helped to develop a deeper seated aversion to secession and a more earnest desire for the preservation of the Union, and thus that they served to bring the reluctant citizens of the North to that ultimate decision for the overthrow of slavery which even President Lincoln hesitated to avow until he issued his Emancipation Proclamation, January 1st, 1863? Or can we doubt that, during the same years, the recorded utterances of Daniel Webster touching the evils of threatened secession and the value of our cherished Union sank deeper into the hearts of his countrymen and left a more abiding impression?

Webster's courage, as I have said, was unflinching. While it probably was inherited, in good part, from his parents — especially from his father, who was a noted Indian fighter, and who served in the Revolutionary War, with the approval of no less distinguished a leader than General Washington, — it doubtless was built largely upon the consciousness of his own great powers. When he was asked by some timorous person, after the memorable speech of Hayne in the Senate — containing some personalities respecting himself — whether he felt confident he could answer him, he replied: "Answer him, I'll grind him finer than snuff."

Hayne's speech was concluded, January 25th, 1830; and Webster spoke on the following day. There was no opportunity for elaborate preparation. He could do nothing more than hastily to marshal his forces; and — relying upon his courage, upon his wonderful memory of the facts to be presented or discussed, upon a thorough knowledge of his audience, upon his patriotic impulses, his instinctive love of justice, his perfect self-possession, his clear insight, his great logical power, his constructive imagination, his keenness of irony and sarcasm, his facility in the choice of words, his majestic presence, his splendid vocal equipment, and his impressive delivery, — to trust to the inspiration of the moment for his modes of expression and for such tactful conduct as would lead to the desired end. Let us observe that, *in this speech, all these wonderful qualifications and powers were exer-*

cised to a high degree. Indeed, in no other recorded speech, so largely extemporaneous, has there ever been shown, to the best of my belief, such a remarkable combination of the great powers which bring victory to an orator. He did, indeed, grind Hayne "finer than snuff"; but the grinding process was without malevolence.

It is impossible, in the brief time allotted me, to analyze the speech, and to point out its individual merits. An acquaintance with it must be presumed, or it must be commended to you for your faithful perusal. There is a spontaneity in it such as characterizes the highest efforts of genius. It moves on with a mighty tide, the resistless sweep of which commands perpetual admiration. We almost wonder, as we approach the end, how such a speech ever could have been made without direct inspiration from above.

It is not easy to make a fair comparison between Webster's oratory and that of other famous speakers, — the times, the occasions, and even the men themselves, were so different.

The concise elaboration of Demosthenes' speeches and their unfitness, to-day, for any but an exceptional audience have already been remarked upon. We study and admire them as literature, not as models for our imitation. It has been said: They are "the most elaborate compositions that ever fell from human lips," and that, "as such, they defy competition." Probably, in many respects, they are peer-

less. But it is hardly presumable that Demosthenes, who, in his early attempts at oratory, was a pitiful stammerer, ever so completely overcame his impediment as to acquire as noble an elocution as Webster's. History informs us that the effectiveness of his oratory, for the ends he strove to attain, was, in notable instances, a failure. This is true respecting his Philippics. Demosthenes — sad to say — died by his own hand.

The following extract from his "Oration for the Crown," in reply to Æschines, is submitted as a specimen of his invectives: —

> "But I must, it seems — though not naturally fond of railing, yet on account of the calumnies uttered by my opponent — just mention, in reply to so many falsehoods, some leading particulars concerning *him;* and show who he is, and from whom descended — that so readily begins using hard words, — and what language he carps at, after uttering such as any decent man would have shuddered to pronounce. Why, if my accuser had been Æacus, or Rhadamanthus, or Minos, instead of a prater, a hack of the market, a pestilent scribbler, I don't think he would have spoken such things, or found such offensive terms, — shouting, as in a tragedy, 'O Earth! O Sun! O Virtue!' and the like, — and, again, appealing to Intelligence and Education — by which the honorable is distinguished from the

> base. — All this, you undoubtedly heard from his lips. — Accursed one! What have *you* or *yours* to do with virtue? How should *you* discern what is honorable or otherwise? How were *you* ever qualified? What right have *you* to talk about education? Those who really possess it would never say as much of themselves, but rather blush if another did; those who are destitute, like you, but make pretensions to it from stupidity, annoy the hearers by their talk, without getting the reputation which they desire."

These words of Demosthenes are but little else than personal abuse, although measurably warranted by the gross attack on him. But did they reflect credit upon the orator, or help his cause in the esteem of his hearers? Better suited, were they, undoubtedly, to Demosthenes' time than they would be to our own; for heathen malice was not then softened by Christian charity. But the chief question for our consideration is: Does such language contribute to true eloquence? We must admit that it has a vigorous ring and is pleasing to a resentful spirit. Yet is it not akin to the familiar tirades such as are condemned to-day even in newspapers?

Are like expressions found in any of Webster's speeches? On the contrary, do we not find instead a nobler language of reproof, which is far more effective? Witness the Reply to Hayne, as hereinafter quoted; and see with what fairness, what lofty con-

sciousness of rectitude, the speaker wards the thrusts of his opponent and turns back upon him the sharp personalities meant to disable himself, — how adroitly he touches his pride and pierces his moral nature with that keen sense of wrongdoing which puts him to shame and pursues him as with a whip of scorpions.

Passing on to a period about two centuries later than that of Demosthenes, our attention is drawn to Cicero, the greatest of the Latin orators. In intellect and character, he towered high above most of his illustrious contemporaries. Yet it has been said that, from the first, he was "an imitator and adapter," rather than an original thinker, — and that, throughout, he was "a follower, rather than a leader — in action as well as in speculation," — that "his mental training disposed him to admire past models." If this be true, he certainly was the inferior of Webster in intellectual vigor and independence of character. But it can hardly be denied that Cicero, in his later years, showed much boldness, originality and freedom of thought. In his own rare times, he was regarded as the equal of Demosthenes. A capable literary critic has remarked that Cicero "exhibits the happy medium between the dryness of Demosthenes and the exuberance of the Asiatic school," that "no ancient orator could so easily and naturally turn the feelings of an audience in any desired direction." We may well believe that Cicero, being of a more ardent temperament than Webster, could more

readily kindle the enthusiasm of a promiscuous assembly.

Cicero has been criticised as frequently insincere. His character was, in many respects, that of a courtier. He was vain, and greedy of praise. These faults occasionally marred his oratory; but its impressiveness was not so much lessened thereby in his own day as it would be in ours.

In his early culture, he was Webster's superior; in his later, it may be questioned if he was his equal. During the centuries that separated them, the world advanced in learning, character and refinement; and the change doubtless affected Webster for his advantage. Measuring the two by the immediate success of their oratorical efforts, there is, perhaps, no great difference; but testing them by the intrinsic worth and abiding influence of their speeches, the palm of superiority — in my judgment — must be given to Webster.

I submit, as a specimen of Cicero's invective — for comparison with that of Demosthenes', before quoted — an extract from one of his speeches against Mark Antony. The translation is by Rufus Choate, and is remarkable for its preservation of the spirit of the original. It is an orator's translation of a great orator's speech.

> "Lay hold on this opportunity of our salvation, conscript fathers, — by the immortal gods, I conjure you! — and remember that you are the

foremost men, here in the council-chamber, of the whole earth. Give one sign to the Roman people that, even as now they pledge their valor, so you pledge your wisdom to the crisis of the state. But what need that I exhort you? Is there one so insensate as not to understand that, if we sleep over an occasion such as this, it is ours to bow our necks to a tyranny, not proud and cruel only, but ignominious, but sinful? Do ye not know this Antony? Do ye not know his companions? Do ye not know his whole house — insolent, — impure, — gamesters, — drunkards? To be slaves to such as he, to such as these, were it not the fullest measure of misery, conjoined with the fullest measure of disgrace? "

This language, although severe, is less a tirade than that quoted from Demosthenes' Oration for the Crown.

Some time after the delivery of the speech — and largely, no doubt, because of the anger it caused — Cicero was assassinated by Mark Antony's hirelings.

It may suffice, in our present consideration of Webster's oratory, to compare it with that of one other great speaker, namely, Edmund Burke, who is generally recognized as the most eminent of British orators. We must remember, however, that, of Burke's extemporaneous speeches, we have but few reports which closely approximate to them as actually delivered. The art of shorthand writing was

then in its infancy; and what has come down to us of Burke's speeches was either carefully written out beforehand or was enlarged from imperfect notes, supplemented by recollection or by a vigorous imagination.

It has been remarked — truthfully, I believe — that "Burke was not greatest as an orator," that "the best of his speeches are splendid essays," and that "before an audience, he was often theatrical and declamatory," and frequently ineffective. He had a badly regulated voice; and, to say the least, his delivery was infelicitous.

Grattan, his fellow-countryman and ardent admirer, wrote of him: "Burke is unquestionably the first orator of the Commons of England, notwithstanding the want of energy, the want of grace, and the want of elegance in his manner. . . . He was a prodigy of nature and of acquisition; he read everything, he saw everything; his knowledge of history amounted to a power of foretelling."

Erskine, who was equally an admirer of Burke, tells us that Burke's speeches often cleared the benches of the House of Commons. It is said that Erskine, himself, once crept away beneath the benches, to escape *listening* to a speech of Burke's, which, when it was printed, he read over and over again until he had thumbed it to rags.

Macaulay, a critical student of Burke's oratory, as well as of the general history of his time, says: he was "ignorant, indeed, or negligent, of the art of adapting

his reasonings and his style to the capacity and taste of his hearers; but, in aptitude to comprehension and richness of imagination, superior to every orator, ancient or modern."

Earl Russell wrote of Burke: "The fault of his mind was that imagination was allowed to prevail over judgment, and the fault of his temper was a want of patience"; the events of the French Revolution drove him to a state of frenzy, in which all control from reason was lost.

Mr. Lodge, Webster's biographer, remarks: —

> "It may be conceded at once that, in creative imagination and in richness of imagery and language, Burke ranks above Webster. But no one would ever have said of Webster as Goldsmith did of Burke, —

'Who, too deep for his hearers, still went on refining,
And thought of convincing while they thought of dining.' "

> Mr. Webster (his biographer continues) "never sinned by over refinement or over ingenuity; for both were utterly foreign to his nature. Still less did he impair his power in the Senate, as Burke did in the Commons, by talking too often and too much. If he did not have the extreme beauty and grace of which Burke was capable, he was more forcible and struck harder and more weighty blows. He was greatly aided in this by his brief and measured periods, and his strength

was never wasted in long and elaborate sentences. Webster, moreover, would never have degenerated into the ranting excitement which led Burke to draw a knife from his bosom and cast it on the floor of the House."

Webster's strongest point, perhaps, was "his absolute good taste."

As a specimen of Burke's invective oratory, I invite your attention to the following quotation from his speech in the trial of Warren Hastings: —

"My Lords, you have now heard the principles on which Mr. Hastings governs the part of Asia subjected to the British empire. Here he has declared his opinion that he is a despotic prince, that he is to use arbitrary power; and, of course, all his acts are covered with that shield. 'I know,' says he, 'the Constitution of Asia only from its practice.' Will your Lordships submit to hear the corrupt practices of mankind made the principles of Government? *He*, have arbitrary power? My Lords, the East-India Company have not arbitrary power to give him; the King has no arbitrary power to give him; your Lordships have not; nor the Commons; nor the whole Legislature. We have no *arbitrary* power to give; because arbitrary power is a thing which neither any man can hold nor any man can give. No man can lawfully govern himself according to his own will,

much less can one person be governed by the will of another. We are all born in subjection, all born equally — high and low, governors and governed — in subjection to one great, immutable, preëxistent law, prior to all our devices and prior to all our contrivances, paramount to all our ideas and to all our sensations, — antecedent to our very existence, by which we are knit and connected in the eternal frame of the universe, out of which we cannot stir.

"This great law does not *arise* from our conventions or compacts; on the contrary, it *gives* to our conventions and compacts all the force and sanction they can have; it does not arise from our vain institutions. Every good gift is of *God;* all power is of God: and He who has given the power, and from whom alone it originates, will never suffer the exercise of it to be practised upon any less solid foundation than the power itself. . . . We may bite our chains, if we will: but we shall be made to know ourselves, and be taught that man is born to be governed by *law;* and he that will substitute *will,* in the place of it, is an enemy of God."

This passage from Burke, although plainly denunciatory, is in no way ruthless. It is an appeal to reason; and is commendable alike for clearness, impassioned earnestness and logical force. But it lacks one of the chief essentials of oratory, in the fact that

it is so far-reaching in its philosophy — so much beyond the ordinary thinking of the average man — that it requires a momentary pause for reflection in order to its full comprehension.

Mr. McCall, a member of Congress from Massachusetts, referring to Burke — at the Webster Centennial Celebration at Dartmouth College in 1901 — said, in a spirit of just appreciation: —

> "He is, I think, superior to Webster as a political philosopher, and also in breadth of information and imaginative power; but, in the excellence of the great mass of oratorical work which he left behind him, he does not much surpass Webster, if at all. He presents more gorgeous passages; but even his most glittering fabrics do not imply the intellectual strength shown in the simple solidity of Webster. But, if it be admitted that he precedes Webster in the permanent value of his speeches, — in their temporary effect, I do not think he can be classed with him. He often shot over the heads of his audience, and some of his greatest speeches emptied the House of Commons. It was said of him that he always seemed to be in a passion. Webster never permitted himself to be in a frenzy, fine or otherwise."

Time forbids my attempting to compare Webster with Mirabeau, the great French orator, or with Cas-

telar, the great Spanish orator lately deceased. But, were the comparisons made, I believe that, in general, they would be to the advantage of Webster.

Among American orators, Webster is recognized by all as the chief. His speeches have entered widely into our literature and become a part of the treasured products of the nation. They are cherished as are those of none of his compeers. They have largely shaped the destinies of the country; and, if stricken out of existence, would leave a great gap in its history. For immediate effectiveness and abiding influence, taken together, — I believe that the verdict of the ages will be that they stand unequaled.

Yet it must be acknowledged that, in mere popular oratory, Webster was often surpassed; that he had not the immediate personal magnetism of Clay, of Choate, or of many others.

In closing, I invite your attention to a few sentences of Webster's Reply to Hayne, which, being somewhat in the nature of invective, may serve for comparison with the passages before quoted from Demosthenes, Cicero, and Burke: —

> "Sir, It was put as a question for me to answer, and so put as if it were difficult for me to answer, whether I deemed the member from Missouri an overmatch for myself in debate here. It seems to me, Sir, that this is extraordinary language, and an extraordinary tone, for the discussions of this body.

"Matches and overmatches! Those terms are more applicable elsewhere than here, and fitter for other assemblies than this. Sir, the gentleman seems to forget where and what we are. This is a Senate, a Senate of equals, of men of individual honor and personal character, and of absolute independence. We know no masters, we acknowledge no dictators. This is a hall for mutual consultation and discussion; not an arena for the exhibition of champions. I offer myself, Sir, as a match for no man; I throw the challenge of debate at no man's feet. But then, Sir, since the honorable member has put the question in a manner that calls for an answer, I will give him an answer; and I tell him, that, holding myself to be the humblest of the members here, I yet know nothing in the arm of his friend from Missouri, either alone or when aided by the arm of *his* friend from South Carolina, that need deter even me from espousing whatever opinions I may choose to espouse, from debating whenever I may choose to debate, or from speaking whatever I may see fit to say, on the floor of the Senate. Sir, when uttered as matter of commendation or compliment, I should dissent from nothing which the honorable member might say of his friend. Still less do I put forth any pretensions of my own. But when put to me as matter of taunt, I throw it back, — and say, to the gentleman, that he could possibly

say nothing less likely than such a comparison to wound my pride of personal character. The anger of its tone rescued the remark from intentional irony, — which otherwise, probably, would have been its general acceptation. But, Sir, if it be imagined that by this mutual quotation and commendation; if it be supposed that, by casting the characters of the drama, assigning to each his part, to one the attack, to another the cry of onset; or if it be thought that, by a loud and empty vaunt of anticipated victory, any laurels are to be won here; if it be imagined, especially, that any or all these things will shake any purpose of mine, I can tell the honorable member, once for all, that he is greatly mistaken, and that he is dealing with one of whose temper and character he has yet much to learn. Sir, I shall not allow myself, on this occasion, I hope on no occasion, to be betrayed into any loss of temper; but if provoked, as I trust I never shall be, into crimination and recrimination, the honorable member may perhaps find, that, in that contest, there will be blows to take as well as blows to give; that others can state comparisons as significant, at least, as his own, and that his impunity may possibly demand of him whatever powers of taunt and sarcasm he may possess. I commend him to a prudent husbandry of his resources."

These are noble words, uttered in the full consciousness of the dignity of a Senator and of the decorum befitting the Senate Chamber. They are, in substance, a merited protest against personal and partisan strifes. Spoken under provocation, they bear no trace of animosity, — but dispassionately meet and break the force of angry taunts, declare fearlessness of purpose, answer empty vaunting with suggestive forewarning, and bid defiance to a hostile encounter. Considered from a moral standpoint, as well as from an intellectual, they are deserving of the highest praise.

To competent and impartial judges, I leave the further comparison of Webster's Reply to Hayne with other memorable triumphs of oratory, — confident in the belief that, for varied and comprehensive excellence, they will find it unequaled. And, if such be the result, then I ask: Why should not Webster be enthroned, supreme, among the world's great speakers?

X

HINDOO POETRY

EARLY in the present century, Lord Byron, England's most gifted romantic poet, tuned his harp to the following lines: —

"Know ye the land where the cypress and myrtle
Are emblems of deeds that are done in their clime,
Where the rage of the vulture, the love of the turtle,
Now melt into sorrow, now madden to crime?
Know ye the land of the cedar and vine,
Where the flowers ever blossom, the beams ever shine;
Where the light wings of zephyr, oppressed with perfume,
Wax faint o'er the gardens of Gull in her bloom;
Where the citron and olive are fairest of fruit,
And the voice of the nightingale never is mute;
Where the tints of the earth and the hues of the sky,
In color though varied, in beauty may vie, —
And the purple of ocean is deepest in dye;
Where the virgins are soft as the roses they twine,
And all save the spirit of man is divine?
'Tis the clime of the East, 'tis the land of the sun, —
Can he smile on such deeds as his children have done?
Oh! wild as the accents of lovers' farewell
Are the hearts which they bear and the tales which they tell."

Byron, doubtless, was much indebted for his inspiration to oriental poetry,— sipping often, probably, at the sparkling springs of Firdusi and Saadi. Other British bards, his contemporaries, likewise refreshed their muse at the same source.

Yet the richest and most copious fountains of the East were then scarcely opened to Europeans; for the literature of the great peninsula which lies beyond the Indus, and which for more than three thousand years has been the dwelling place of a highly civilized population, was but just beginning to be known to the Western World.

And what is the character of this literature? Surprising as it may seem, it is largely poetic. It embraces, in metrical form, the four sacred books of the Hindoos, known as the Vedas, — two marvelous epics, the Maha Bharata and the Ramayana, both of remarkable length, — the Laws of Menu, an elaborate Brahmanical system of religious social and civil observances (think of laws written in poetry), the Puranas, or legends about the later gods of Brahmanism, — besides admirable collections of fables, hosts of love songs, and numerous dramatic compositions, many of a high order. All, but the fables and the later love songs and dramas, are religious.

Nearly the whole of this poetic literature, besides a large body of Hindoo prose, has been brought to our knowledge within a century. Its introduction to the Western world constitutes an epoch, second in importance only to the revival — during the period known as the Renaissance — of acquaintance with the Greek and Latin classics. With few exceptions, it is ancient — being written in Sanskrit, a language disused in popular intercourse more than two thousand years ago.

As all the *sacred* books of India are in this language, the Sanskrit is peculiarly revered. For a long time, the Brahmans refused to teach it to foreigners, and would scarcely allow so much as a sight of their sacred books. Even the powerful influence of the East India Company temporarily failed to secure such a privilege. But the reluctance of its possessors at length was measurably overcome; and the result was the publication, for English readers, near the close of the eighteenth century, of a Sanskrit grammar and a few translations from the sacred tongue, and since then, of an important body of Sanskrit literature, rendered into English, French and German. A commission, appointed, some years ago, by the British East India Government, has catalogued over ten thousand separate Sanskrit works, amounting, it is believed, to more than the whole of the classic literatures of Greece and Italy combined. Some of these works probably are of little account; yet the great majority undoubtedly will prove valuable. During the last fifty years, professorships of the Sanskrit language and literature have been established in nearly all the principal universities of Europe and America, — thus showing the high esteem in which this branch of learning is already held.

The oldest of the poetic books of the Hindoos, and indeed of any of the books of India, is the Rig-Veda, a collection of hymns including prayers and ascriptions of praise to the spirits of their dead ances-

tors and to the deified powers of Nature. The word, Rig, means praise; and Veda, highest knowledge. The hymns are of various authorship. The earliest are commonly believed to have been composed about 2,400 years before Christ; the latest, 1,500 years before Christ. They number a thousand and seventeen — all, arranged in stanzas of two lines each, called *astokas*. Although originated at so early a period, they probably were not written down until about a century after the Christian era — when they were inscribed, first, on palm leaves, which were kept solely for the inspection of the writers. The earliest manuscripts which have come down to us date from about fifteen hundred years after Christ. It is remarkable that, through a period of three thousand years or more, the knowledge of the Rig-Veda was transmitted simply by oral repetition.

The hymns are taught only in the schools of the Brahmans, or priests, who claim, as their especial prerogative, a right to impart a knowledge of them. The manner of recital is deemed quite as important as the matter; since it is asserted that even the accents and accompanying gestures were revealed directly from Brahma.

Every male Hindoo of the Brahmanical faith, except those of the lowest castes, is required to learn the Rig-Veda by heart. The task is, by no means, trifling; since the Rig-Veda is about a third as large as our English Bible. Yet, to-day, there are probably hundreds of thousands of scholars in India who can

repeat every one of its hymns, with the appropriate accents, without a single mistake.

Before quoting any of the hymns, a few words respecting the mythology upon which they are based may be desirable.

The chief gods of the Hindoos are called *devas*, bright ones. The number of devas is commonly said to be twelve; although there are nearly three thousand other Hindoo deities or divinities claiming recognition. The supreme god, as known by his most ancient name, is called Dyaus. From him, according to the notion of his worshipers, there appear to have sprung other gods, each being a manifestation of the Supreme Deity in respect to some of his attributes or relations to his creatures, and each being addressed by a distinctive name according to the prominence in the mind of the worshiper of the particular manifestation. Gradually the consciousness of the *identity* of these gods seems to have faded, although occasionally revived; and each, therefore, was and is invoked as supreme.

The ancient name of the Supreme Being, Dyaus, meaning the bright one, was especially connected with the bright sky, or heaven above. Accordingly Dyaus, the heaven, is represented as married to Prithivi, the earth; and the illustrious pair is set forth as the parents of later gods. Dyaus and Prithivi nearly correspond to Ouranos and Gaia in the Greek mythology.

Regarded as brooding over and surrounding the earth, the bright sky is personified as Varuna. The

hymns addressed to Varuna are beautiful and deeply religious. He is set forth as the creator and upholder of all things, just as, in our Christian Bible, the Son of God is made known to us as the Maker of the worlds, the brightness of God's glory and "the express image of his person," and as "upholding all things by the word of his power."

One of the hymns of the Rig-Veda, as translated into prose, says: —

> "Varuna dwells in all worlds, as sovereign; indeed the three worlds are embraced by him. The wind which resounds through the firmament is his breath. He has placed the sun in the heavens and opened for it a boundless path. He has hollowed out the channels of the rivers. It is by his wise contrivance that, though all the rivers pour out their waters into the sea, the sea is never filled. By his ordinance, the moon shines in the sky, and the stars which are visible by night disappear on the approach of daylight. Neither the birds flying in the air, nor the rivers in their sleepless flow, can attain a knowledge of his power or his wrath. His spies behold both worlds. He himself has a thousand eyes. He perceives all the hidden things that have been or shall be done."

This hymn reminds us of portions of the Psalms and of the Book of Job, but especially of the following words of Ecclesiastes, or the Preacher: —

> "One generation passeth away, and another generation cometh; but the earth abideth forever. The sun also ariseth, and the sun goeth down and hasteth to his place where he arose. The wind goeth toward the south, and turneth about unto the north; it whirleth about continually, and the wind returneth again according to his circuits. All the rivers run into the sea; yet the sea is not full: unto the place from whence the rivers come, thither they return again."

The Hindoo mind, during the first Vedic period, ran back to the conception of a time before the Supreme Being had manifested himself in any form, or before he had exercised his creative power. This conception seems wonderful, almost inexplicable, in the speculative thought of a simple pastoral people such as the Aryan tribes were when they first came into India. Yet we find it clearly expressed in hymns of the Rig-Veda, composed probably as many as four thousand years ago. It may be deemed strongly indicative of an earlier period of superior knowledge and intellectual activity. Can it be otherwise than that such a period existed?

As thus conceived of, Dyaus, the Supreme Being, in a state of repose, is termed, objectively, Brahman. "Brahman has no cause, no origin, is not produced by anything"; but "is eternal, universal, single, independent, free from any characteristics, sovereign." Brahman is neuter, and is referred to only by the

neuter pronoun. Brahman is a passive Spirit. But when this passive Spirit becomes active, and is recognized as wishing to create what is manifest in Nature, including man, then it is designated as Brahma, and becomes a masculine person, *He*, the subsequent Creator.

Of the time when only Brahman existed, an ancient Vedic hymn says: —

> " Nor aught nor naught existed: yon bright sky
> Was not, nor heaven's broad roof outstretched above.
> What covered all? what sheltered? what concealed?
> Was it the water's fathomless abyss?
> There was not death; hence was there naught immortal.
> There was no confine betwixt day and night.
> The only One breathed, breathless in itself;
> Other than it, there nothing since has been.
> Darkness there was; and all at first was veiled
> In gloom profound, an ocean without light.
> The germ that still lay covered in the husk
> Burst forth, one nature, from the fervent heat.
> Then first came Love upon it, the new spring
> Of mind, — yea, poets in their hearts discerned,
> Pondering, this bond between created things
> And uncreated."

The personal name, Love, as used in the last sentence, was originally expressive of the desire to act — *to act worthily*. Desire must be felt before the will to do. It is desire which constitutes the spring of action. With such explanation, I repeat the sentence last quoted, asking you to bear in mind that the name Love is a personification of the desire to act, as first formed in intelligent being.

" *Then first came Love upon it, the new spring*
Of mind, — yea, poets in their hearts discerned,
Pondering, this bond between created things
And uncreated.' — " Comes this spark from earth,
Piercing and all-pervading, or from heaven?
Then seeds were sown, and mighty power arose,
Nature below, and Power and Will above:
Who knows the secret? Who proclaimed it here,
Whence, whence this manifold creation sprang?
The gods, themselves, came later into being.
Who knows from whence this great creation sprang?
He, from whom all this great creation came,
Whether his will created or was mute,
The Most High Seer that is in highest heaven,
He knows it."

Here is a prose translation of portions of a hymn to Brahma, the *one* God: —

> " In the beginning, there arose the source of golden light. He was the only born lord of all that is. He established the earth and the sky." . . . " He who gives life, He who gives strength, whose blessing all the bright gods desire, whose shadow is immortality," . . . " He who is the only life of the bright gods," . . . " He who is God above all gods ": . . . " May he not destroy us! "

Another hymn says: —

> " Wise poets make the beautiful-winged one manifold, by words, though he is but one."

Another says: —

> " Thou, Agni [*god of fire*] art Indra [*god of air and rain*], bountiful to the excellent; thou art Vishnu [*god of the sun*], the wide-stepping [*the sun being represented as*

traversing the heavens in three strides, with his rising, culminating and setting]; Son of strength, in thee reside all the gods."

From these hymns, it is manifest that Hindoo mythology has an unmistakable background of monotheism, or faith in but one God.

Edwin Arnold, in his India Revisited, denies that the Hindoos are polytheists. He says that all their "various gods and sacred objects are, for the educated Indian, mere 'aids to faith,' manifestations, more or less appropriate and elevated, of the all-pervading and undivided Para-Brahm"; that "even the poor peasant of the fields and the gentle Hindoo wife, perambulating a peepul tree, smeared with red, will tell you that the symbol they reverence is only a symbol."

Yet the number of hymns or prayers in the Rig-Veda which distinctly recognize the existence of one only God is but few. Unfortunately the original monotheism of India is now deeply clouded; and, although accepted by educated Hindoos, is but feebly comprehended and doubtfully held by the masses.

Among the most beautiful of the secondary Hindoo deities is Ushas, the dawn — a pure white-robed being, from whose presence every dark thing flees away. The sky behind the dawn, from which she emerges, is personified as Aditi, the boundless. Aditi is one of the oldest of the Vedic deities. She is associated in thought with the infinite; since the limit of her realm is unknown. As Ushas comes thence,

every morning, bringing the joyful light of day, the abode of Aditi is looked upon as the home of the bright gods. The hopeful Hindoo therefore pictures it as the heaven into which his soul, after it has passed through various transmigrations, will be admitted. He believes that, at last, he will be laid to rest in the bosom of Mother Earth; that his purified spirit — accepted by Yama, the judge of the dead — will be received into companionship with the fathers, in the realms of light; and that eventually he will be swallowed up in life and immortality, or absorbed into Brahman. This idea is partly expressed in the following funeral hymn: —

"Open thy arms, O Earth, receive the dead
With gentle pressure and with loving welcome:
Embrace him tenderly, e'en as a mother
Folds her soft vestment round the child she loves.
Soul of the dead! depart: take thou the path —
The ancient path — by which our ancestors
Have gone before thee. Thou shalt look upon
The two kings, mighty Varuna and Yama,
Delighting in oblations. Thou shalt meet
The fathers, and receive the recompense
Of all thy stored-up offerings above.
Leave thou thy sin and imperfection here;
Return unto thy home once more; assume
A glorious form. By an auspicious path,

. . . . .

Advance to meet the fathers who, with hearts
Kindly disposed towards thee, dwell in bliss
With Yama; and do thou, O Mighty God!
Intrust him to thy guards to bring him to thee,
And grant him health and happiness eternal."

To the student of comparative mythology, the Rig-Veda is of great value. Believed to be, with but two exceptions,* the oldest book known to the world, it is regarded as shedding the strongest light upon the ancient myths common to various branches of the Aryan race. In the Rig-Veda, we find, for instance, the original story of the birth of the goddess of wisdom, Ahana, — who is the same as Ushas, the personified dawn. She is said to have sprung, complete in all her beauty and possessing all her charms, from the head of Dyaus, — just as, in the Greek mythology, Athene is said to have sprung, full-armed, from the head of Zeus, — and as, in the Latin mythology, Minerva, from the head of Jupiter. The explanation is obvious. The dawn is the child of the eastern sky, the primal source of light; and, as in her coming she sheds the first beams of day, so she brings all things to view and opens the pathway to knowledge.

The Rig-Veda is of great value also to the student of comparative philology, or of the kinship of languages spoken by different branches of the Aryan stock. Not many years ago, the language of the Vedas was supposed to be the parent of nearly all the European tongues. Now, however, it is known to have sprung from an earlier form of Aryan speech

* A part of the Egyptian Book of the Dead is thought to have been written more than three thousand years B.C.; and portions, at least, of the Babylonian poem of "Ishtar and Izdubar," about 2000 B.C.

that doubtless was the mother of the later languages to which the Sanskrit is akin. Thus, in Sanskrit, we find *pitar*, for father, — in ancient Persian, *patar*, — in Latin, *pater*, — in Celtic, *athair*, — and in Teutonic, *fadar*.

From investigation of words, common to various languages of the Aryan family, we learn, too, something of the prehistoric character of the Race. We find the word *pitar*, father, means he who protects and supports; *swaser*, sister, she who consoles and pleases; *duhitar*, daughter, a milkmaid. In Sanskrit, the patriarch of a tribe, is called the "lord of the cattle." From various words and phrases, it is evident that our Aryan ancestors were engaged chiefly in pastoral pursuits. They had oxen, sheep, horses, and dogs. Even to-day, in India, the cow is peculiarly revered. Good Brahmans, it is said, will feed a cow before they take their own breakfast, exclaiming, "Daughter of Surabhi! formed of five elements, auspicious, pure, and holy, sprung from the sun, accept this food from me. Salutation and peace!"

The Aryans also were agricultural. They raised wheat, barley, flax and hemp. They must have been considerably civilized: for they were organized into village communities; dwelt in well-built houses, surrounded by walls; and had roads suitable for wheel-carriages.

They knew something too of river navigation; for all the Aryan languages have the words, boat, rudder and oar. Yet it is manifest that they lived inland; since there is no common word for ocean.

The Rig-Veda was sung, it is said, in the valley of the Indus River, before the Aryans had penetrated far into India. It is deemed, therefore, our authority for the earliest manners and customs of our ancestors, as well as for their simple and childlike beliefs. Max Müller remarks, "The whole history of the world would be incomplete without this first chapter in the life of Aryan humanity which has been preserved to us in Vedic literature." He further says: "While Hesiod gives us a past theogony, we see in the Veda the theogony itself, the very birth and growth of the gods — that is, of the word for gods, — and in its later hymns, the subsequent development of these divine conceptions."

No translations of any of the hymns of the Rig-Veda were made before the year 1833. Between 1848 and 1857, the entire book was rendered into English by Mr. Wilson. It was a work of great labor — not only from the want of linguistic helps, but also because of the obscurity of the mythology and the strangeness of the manners, customs, etc., to which it referred. When the translation was finished, Mr. Wilson called upon a prominent London publisher; and modestly informed him that he had a treasure to offer, the Rig-Veda. But, so little known at that time in Europe was this wonderful sacred book, that the publisher, looking at him with a blank stare, replied: "Pray, sir, what is the Rig-Veda?"

Considered with reference to its poetic merit, the Rig-Veda is inferior to the Book of Job, which, until

recently, was believed by many to be the most ancient of the Semitic writings. It seldom attains such heights of sublimity; nor, in general, is it characterized by such strength of thought; neither is the grandeur of its composition so well sustained. Yet many of its hymns are unquestionably of a high order.

Of the three later Vedas, it may be remarked that they consist almost wholly of liturgies for worship and rules for sacrifices. As long periods of time intervene between the several compositions, they differ somewhat in character — growing more metaphysical and more complex and refined. But I must forbear to discuss them.

Turning now to the oldest of the Indian epics, I will speak briefly of the "Maha Bharata." Bharata is a proper name; the prefix *Maha* means great. The poem, therefore, must be understood as relating to the great Bharata, a famous Indian warrior. Mr. Talboys Wheeler, the historian of India, says: "The 'Maha Bharata' is the most voluminous and, perhaps, the most valuable epic which has hitherto been preserved in any written language." Rendered into English, it would make a dozen good-sized octavo volumes. It is at least seven times as long as the Iliad and Odyssey of Homer combined. No complete translation of it has yet been made.

The Maha Bharata doubtless was a collection of ballads originally sung to some rajah. It is therefore wanting in unity. The events of which it treats belong to the early Brahmanical period, or to a time

when the Aryan invaders had penetrated Hindoostan no farther than to the site of the present City of Delhi. The principal action of the poem relates to a quarrel between the Kauravas and the Pandavas, who were first cousins, and were descendants of the great Bharata. It was a struggle between kinsmen for land and throne. Some interpreters regard the poem as symbolic, typifying the struggle between light and darkness or between the principles of good and evil. They declare that the heroes are the same as the gods of the Rig-Veda, the Pandavas representing the good, the beautiful and the strong, and the Kauravas, the wicked and the weak.

The favorite hero, in Hindoo esteem, is Yudisthira, the chief or rajah of the Pandavas. In general, he is cold and passionless; but he has lofty principles and ambitions. His supporters triumph, and he gains the throne. Yet he is unsatisfied. He feels that true happiness and peace of mind must be found in the renunciation of worldly things and in a union with the Infinite. By many scholars, the first idea of such a renunciation and of a union with the Divine Being was long believed to have been developed originally in the teachings of Christ, especially as recorded in St. John's gospel; but it now appears that it is as ancient as the oldest Aryan records, although unknown in the literatures of Greece and Rome.

Yudisthira tells his four brethren and his and their one wife (for the practice of polyandry then prevailed) of his purpose to renounce the throne and

set out to seek the heaven of Indra. Clothed in the garments of pilgrims, all of them wander forth together, accompanied by a favorite dog. One by one, they drop away, until at length only the self-denying Yudisthira and his dog are left. They reach the gate of Heaven; but Indra will not admit the dog. Yudisthira refuses to enter without his beloved and faithful brute companion, and Indra then opens the gate to both. The hero inquires for his brethren and wife, and is informed that they are in hell. But let the poem tell the rest.*

"Show me those souls!
I cannot tarry where I have them not.
Bliss is not blissful, just and mighty Ones!
Save I rest beside them. Heaven is there
Where Love and faith make heaven. Let me go!

And answer made the hearkening heavenly Ones:
Go, if it seemeth good to thee, dear son!
The King of gods commands we do thy will.

So saying, the sage went on: Dharma's own voice
Gave ordinance; and from the shining bands
A golden Deva glided, taking hest
To guide the King there where his kinsmen were.
So wended these — the holy angel first, —
And in his steps, the King, close following.
Together passed they through the gates of pearl,
Together heard them close; then to the left —
Descending by a path evil and dark,
Hard to be traversed, rugged, — enter they

* The following translation is from Sir Edwin Arnold's Indian Idylls. See footnote hereafter, on page 249.

THE SINNERS' ROAD. The tread of sinful feet
Matted the thick thorns carpeting its slope;
The smell of sin hung foul on them; the mire
About their roots was trampled filth of flesh,
Horrid with rottenness and splashed with gore
Curdling in crimson puddles, where there buzzed
And sucked and settled creatures of the swamp,
Hideous in wing and sting — gnat-clouds and flies,
With moths, toads, newts and snakes red-gulleted.
. . . . . .
A burning forest shut the roadside in
On either hand; and, 'mid its crackling boughs,
Perched ghastly birds, — or flapped amidst the flames,
Vultures and kites and crows, with brazen plumes
And beaks of iron: and these grisly fowl
Screamed to the shrieks of Prets — lean famished ghosts,
Featureless, eyeless, having pin-point mouths,
Hungering, but hard to fill, — all, swooping down.
. . . . . .
By such a path, the King passed, sore-afeard,
If he had known of fear . . .
The Asipatra wood
Spread black in sight, whereof the undergrowth
Was sword-blades. . . .
Next to this,
Strewn deep with fiery sands, an awful waste
Wherethrough the wicked toiled with blistering feet
. . . . . .
. . . . . Last, the gorge
Of Kutashála Mali — frightful gate
Of utmost Hell, with utmost horrors filled.
Deadly and nameless were the plagues seen there;
Which, when the monarch reached, nigh overborne
By terrors and the reek of tortured flesh,
Unto the angel spake he: 'Whither goes
This hateful road; and where be they I seek,

Yet find not? ' Answer made the heavenly One:
Hither, great King, it was commanded me
To bring thy steps. If thou be'st overborne,
It is commanded that I lead thee back
To where the Gods wait."

The most fearful lines in this description of Hell, I have purposely omitted. They are too horrid for any one who is not compelled to read them, as a student of literature, — more dreadful even than anything in Dante's Inferno. Yet they show a wonderful power of imagination and a picturesque realism, couched in language the awfulness of which is unsurpassed in the whole range of the world's poetry.*

We must not leave Yudisthira in the dismal abode. Overcome with the dreadful scene, and spent with the toil of his wretched travel, he turns heavenward. But he hears his kindred, pleading that he will tarry and comfort them —

" These pleadings, wailings all around the place, —
. . . . . words of woe,
Humble and eager! — and compassion seized
His lordly mind. ' Poor souls unknown! ' he sighed,
And hellwards turned anew . . .
. . . . . .

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* Readers who wish to see the omitted lines above mentioned will find them in Sir Edwin Arnold's translation of Indian Idylls, included in the published collections of his poetry. These lines are in the last of the idylls; and are embraced in its concluding section — under the title, The Entry into Heaven. The translation is from the Sanskrit of the Swargarohana Parva of the Maha Bharata (see Vol. iv of the Calcutta Quarto Edition).

That soul, fear could not shake, nor trials tire,
Burned terrible with tenderness; the while
His eyes searched all the gloom, his planted feet
Stood fast in the mid horrors. Well-nigh, then,
He cursed the gods; well-nigh that steadfast mind
Broke from its faith in virtue. But he staid
Th' indignant passion, softly speaking this
Unto the angel: 'Go to those thou serv'st;
Tell them I come not thither. Say I stand
Here in the throat of Hell, and here will bide —
Nay, if I perish — while my well-beloved
Win ease and peace by any pains of mine.'
Whereupon naught replied the shining One;
But straight repaired unto the upper light,
Where Sákra sat above the gods, and spake
Before the gods the message of the King.

. . . . . .

At hearing and at knowing that high deed,

. . . . . .

The Presence of Paradise uprose,
Each Splendor in his place, — God Sákra chief:
Together rose they, and together stepped
Down from their thrones, treading the nether road
Where Yudisthira tarried. Sákra led
The shining van; and Dharma, lord of laws,
Paced, glorious, next. O Son of Bharata!
While that celestial company came down —
Pure as the white stars sweeping through the sky,
And brighter than their brilliance — look! — Hell's shades
Melted before them; warm gleams drowned the gloom;
Soft lovely scenes rolled over the ill sights;
Peace calmed the cries of torment; in its bed,
The boiling river shrank, quiet and clear;
The Asipatra Vana — awful wood —
Blossomed with colors; all those cruel blades

And dreadful rocks and piteous scattered wreck
Of writhing bodies, where the King had passed,
Vanished as dreams fade. Cool and fragrant went
A wind before their faces, as these gods
Drew, radiant, to the presence of the King."

Indra then tells him that all he has seen were illusions, to try his character; that his four brethren and wife are in heaven; and that he will return thither, and dwell, happy, with them forever.

There are many episodes in the poem — some of them, sportive. One relates to the adventures of the playful god, Krishna, who was married to sixteen thousand damsels, each of whom thought herself his only wife. But Krishna is merely the bright sun, who brings joyful radiance to thousands of dewdrops.

By the Hindoos, the Maha Bharata is regarded with awful reverence. To read, or even to listen to the reading, of its wonderful words will for the time being prevent sin and insure prosperity on earth and eternal happiness in heaven.

The close of the Maha Bharata is remarkably grand. Mr. Alger, a good oriental scholar, calls it "the culminating point of the poetry of the world."

Respecting the age of this epic, critics are much at variance. Some place it at about fifteen hundred years before Christ, or not far from the period of the exodus of the Children of Israel from Egypt; others set it as late as 200 B.C. Perhaps six or seven hundred years before Christ would be more nearly correct.

The second great epic of India, the Ramayana, is

later. Hindoo society, at the period of its composition, had passed from the feudal state into one in which the Brahmans, or priests, exercised great power. The Laws of Menu were established; and under these and other rules, the inferior castes were sorely oppressed. The Brahmans claimed to be divine, born from the mouth of Brahma, and entitled, by their superior origin and sole right to teach the Rig-Veda, to rule over all other mortals. Even kings were to obey them. They prescribed innumerable penances and sacrifices; inflicted loss of caste; and, in some instances, punished offenders by declaring their souls doomed to transmigration into the bodies of lower animals. Human nature was burdened, by their oppressions, beyond endurance.

At length, between five and six hundred years before Christ, a reformer arose, in the person of Sakya Muni, the founder of Boodhism. He denied that the Vedas were revealed or of infallible authority, that Brahmas were of divine origin, that caste was entitled to recognition, that formal sacrifices, irrespective of pure and noble lives, would take away sin. He urged the renunciation of all that ministers most to our worldly pleasures, and recommended indulgence in contemplative repose, each, as a means of subduing inordinate desire. The ultimate reward of such a life, he announced, would be the sinking of the soul into a blissful Nirvana.

But what is Nirvana? Formerly it was defined by European and American scholars as annihilation:

and, even now, it is asserted by some that it is practically such; since it is concluded that it is the utter destruction of the senses and the will, although not of the body or the soul. Edwin Arnold defines it as "the unspeakable perfected state beyond all such existence as our senses can know, that peace of heaven which 'passeth all understanding.'" A Boodhist chief priest declares that "Nirvana is by no means annihilation, but life beyond the life of the senses, more truly life than we living can know, 'a peace which passeth understanding.'"

Boodhism spread rapidly. A little more than three hundred years later, it became the state religion of India. But, from the beginning, it recognized no Supreme Being; its only god was what man himself could become. It was therefore, in effect, but little else than atheism, — in a strict sense, no religion, but only a system of morals.

In a country, therefore, where intelligence was widely diffused, and where hundreds of thousands had been made acquainted with the *one* God, it failed to answer the demands of the human heart.

Accordingly there came a reaction; a religious war ensued, and the Boodhists were driven out of India into Ceylon and Burmah.

The poem, Ramayana, relates to the events of this war. The hero, Rama, is an incarnation of the god Vishnu; and the heroine, Sita, of the goddess Lakshmi.

In the struggle which ensued, Rama and his followers were resisted by giants and demons. But the

former were not left to fight alone. Rama summoned to his aid the bears and monkeys of the Dekkan — the latter believed to be descended from the gods, and to be incarnated saints and Brahmans, stronger and better than men, who still possessed supernatural powers, and were capable of speech. Hanuman, their leader, was a model of every virtue. On reaching Southern India, in pursuit of their enemies, Hanuman made a flying leap from the mainland, across the intervening strait, to the Island of Ceylon. He and his four-handed companions built a bridge of stone for the passage of Rama and his host. The chain of rocks now extending across the strait, rendering it unnavigable, is believed by the Boodhists to be the remains of this bridge.

The moral tone of the Ramayana is far above that of the Iliad. It teaches the hopelessness of victory without purity of soul and without abnegation of self. In one thing, all critics of the poem agree, namely, in unbounded admiration of its high character. The civilization which it describes is so unlike our own that, as we contemplate it, we seem to be living in another world. The customs it sets forth are such as we can hardly realize. In some parts, it is as marvelous as a fairy tale, yet as simple as a child's prattle. Its pictures of scenery are exquisite.

A few words descriptive of the City of Ayodha — then the most magnificent in India — may be quoted, mainly as they appear in the prose translation by Talboys Wheeler: —

"... Temples richly decorated; stately palaces, with domes like mountain tops, — surrounded by pleasant gardens, full of birds and flowers, and by shady groves loaded with delicious fruits. The tanks were magnificent, covered all over with the white lotus. The city was perfumed with flowers and incense, — decked with gorgeous banners, — and ever filled with the sweet sound of music, the sharp twanging of bows, and the holy chanting of Vedic hymns. Round about it were lofty walls, set with variously colored jewels; and outside was a moat filled with water, deep and impassable. No one was poor, or wore soiled garments; no one was without fine raiment and perfumes, or was unclean, or fed upon unclean things, or neglected the sacraments, or gave less than a thousand rupees to the Brahmans. No man was without learning, or practised a calling that did not belong to his family or caste, or dwelt in a mean habitation, or was without children and kinsmen. Inspecting the world by his spies, as the sun inspects it by his rays, the Maharaja found no person of hostile mind; and he shone resplendent, and illuminated the whole earth."

Often, in the cool of evening, a Brahman priest appears in an Indian village, and reads, from strips of palm-leaves, portions of the Ramayana to the humble listeners who crowd around him. They hang

upon his words with devout attention; for, to them, it is a deeply religious poem. They regard it with the same awful reverence as the Maha Bharata, and give to it attentive heed; since it closes with the promise that whoever reads or listens to it will be freed from all sin.

I would gladly speak of later Indian poetry, especially of the love songs and the dramas, but must refrain.

I close with a single passage — remarkable for the boldness and impressive beauty of its imagery — from a hymn to Vishnu, contained in the famous Gita Govinda, or Indian Song of Songs, as translated by Arnold: —

> " Endless praise arises,
> O thou God that liest,
> Rapt, on Kumla's breast,
> Happiest, holiest, highest! —
> Planets are thy jewels,
> Stars thy forehead-gems,
> Set like sapphires gleaming
> In kingliest anadems;
> Even the great gold Sun-God,
> Blazing through the sky,
> Serves thee but for crest-stone,
> *Jai, jai! Hari, jai!* —
> As that Lord of day,
> After night, brings morrow,
> Thou dost charm away
> Life's long dream of sorrow.
> As on Mansa's water
> Brood the swans at rest,

So thy laws sit stately
On a holy breast.
. . . . . .
Thou Shaker of the Mountain!
Thou Shadow of the Storm!
Thou Cloud that unto Lakshmi's face
Comes welcome, white, and warm!
O thou — who, to great Lakshmi,
Art like the silvery beam
Which moon-sick chakors feed upon
By Jumna's silent stream, —
To thee this hymn ascendeth,
That Jayadev doth sing,
Of worship, love, and mystery;
High Lord and heavenly King! "

THE END

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